Vol. 935 Number 3

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UNITED STATES PATENT AND TRADEMARK OFFICE

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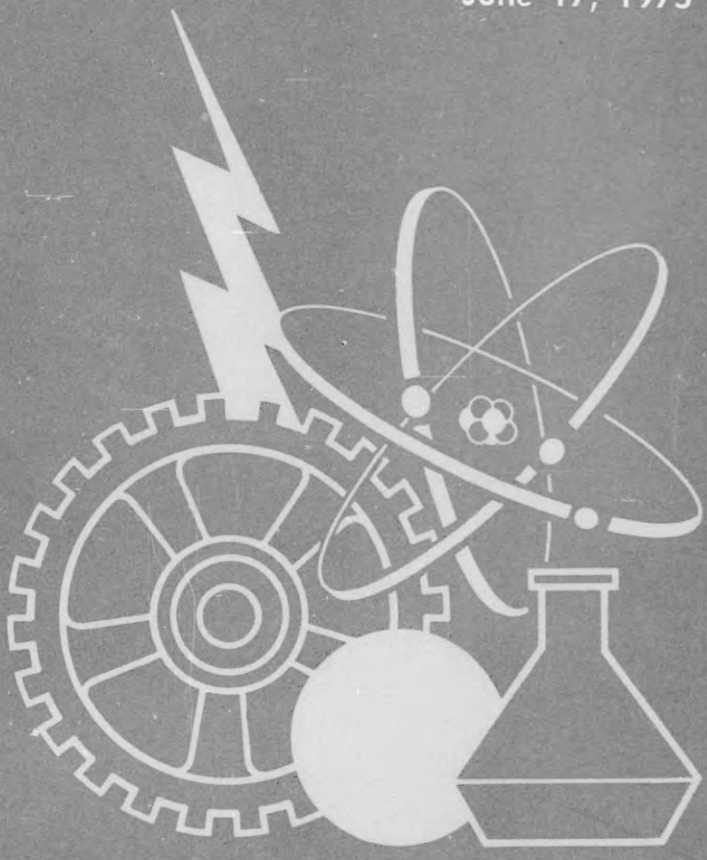

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

June 17, 1975 Volume 935 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

Citation of Prior Art by Applicants

This notice supplements the notice of August 12, 1974, published in the OFFICIAL GAZETTE of September 3, 1974 (926 O.G. 1), and is in response to some of the concerns expressed by members of the patent bar. That notice set forth guidelines the following of which would result in assurance by the Office that the examiner will fully consider the prior art or other material submitted by applicants, their attorneys and agents.

One of the guidelines stated, "If the reference is not in English, a translation of its pertinent portions should be included." In recognition of the high costs of translations, that guideline is hereby modified to accept an alternative to a translation. Accordingly, in lieu of a translation, it shall be sufficient, for purposes of the notice of August 12, 1974, if an equivalent English language patent or publication is provided and identified as an equivalent.

Also, where the applicant has submitted prior art in accordance with the guidelines in a prior application, reference to the prior application and the submission therein will be sufficient for the continuing application. Of course, any change in applicant's position regarding the cited art and its relevancy to the claimed subject matter should be indicated.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

May 19, 1975.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,740,027, Budd, Stackhouse and Slough, RADIO AND TELEVISION RECEIVER COMPONENT ADAPTED ESPECIALLY FOR USE WITH PRINTED WIRING; **3,375,478,** Van Benthuysen and Barden, ELECTRICAL CONTROL AND METHOD OF MAKING THE SAME; **3,518,604,** Beaver and Van Benthuysen, ELECTRICAL COMPONENT; **3,670,285,** J. A. English, VARIABLE RESISTANCE CONTROL WITH END COLLECTOR, **filed** Aug. 1, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c1891, *CTS Corporation* v. *Piher Int'l Corp.* Entry of judgment of order, plaintiff is entitled to judgment of infringement by defendants of Claims 1, 2, 3, 7, 8 and 10 of 3,375,478 and Claim 5 of 2,740,027. Defendants are perpetually enjoined from further infringement of said claims of 3,375,478. Defendants are entitled to declaratory judgment of non-infringement of Claims 1, 5, 7, 8 and 10 of 3,518,604. Defendants' counterclaims for declaratory judgment of invalidity of 2,740,027, 3,518,604 and 3,670,285 are dismissed with prejudice, Sept. 26, 1974.

2,840,020, D. Wise, APPARATUS FOR JOINING FABRIC, **filed** Oct. 8, 1974, D.C., W.D.N.C. (Charlotte), Doc. C–C–74–215, *Daniel Wise Industries, Inc.* v. *Supreme Manufacturing Company.*

2,956,143, L. H. Schall, MICROWAVE OVENS; **3,182,164,** R. Ironfield, ELECTROMAGNETIC ENERGY SEAL, **filed** May 20, 1970, D.C., S.D.N.Y., Doc. 70–C–2055, *Raytheon Company* v. *Tokyo Shibaura Electric Co., Ltd., et ano.* Filed stipulation and order that action is dismissed, each party to bear its own costs, Sept. 24, 1973.

2,966,900, J. Ehrlich, PORT-CONTROLLED TWO-STROKE INTERNAL COMBUSTION ENGINES, **filed** Feb. 26, 1973, D.C., N.D. Ohio (Cleveland), Doc. C73–210, *Ehrlich Engineering Limited* v. *Rupp Industries, Inc.* Order dismissing the complaint, Jan. 21, 1975.

3,016,334, T. J. Lewis, SKIN CREAM CONTAINING LOW GEL STRENGTH, LOW VISCOSITY GELATIN, **filed** Dec. 12, 1974, D.C., S.D.N.Y., Doc. 74–C–5417, *Herbert J. Spoor, Margaret Lewis and Florence Miller* v. *Elizabeth Arden, Inc.*

3,017,323, Gordon, Stephens, Noseworthy and Teare, THERAPEUTIC COMPOSITIONS COMPRISING POLYHYDRIC ALCOHOL SOLUTIONS OF TETRACYCLINE-TYPE ANTIBIOTICS, **filed** Feb. 11, 1974, D.C., C.D. Calif. (Los Angeles), Doc. 74–353–RJK, *Pfizer, Inc.* v. *International Rectifier Corp. and Rachelle Laboratories.* Filed opinion and order that pursuant to 28 U.S.C. Section 1407, the action is transferred to the U.S.D.C. for the District of Minnesota, entered Nov. 22, 1974.

3,047,196, Levine and Phillips, GARMENT HANGER **filed** Jan. 10, 1975, D.C., S.D.N.Y., Doc. 75–C–121, *Cut Rate Plastic Hangers, Inc.* v. *Warbern Packaging Industries.*

3,115,138, McElevenny, Snyder and Sullivan, EVACUATOR, **filed** Nov. 21, 1969, D.C., N.D. Indiana (South Bend), Doc. 69–S–194, *Mercantile National Bank of Chicago et al.* v. *Howmet Corporation and Wayne Pharmacal Supply Co., Inc.* Amended judgment, defendants are hereby directed and required to attend before this court, from time to time as required and to produce such relevant devices, objects, books, documents and papers as requested and to submit to examination, oral or otherwise. Plaintiffs shall recover their damages with respect to the issues raised by the defendants' challenge to the validity of Claims 3 through 14 of said patent, Nov. 29, 1974.

3,120,158, J. M. Macchione, METHOD OF AND APPARATUS FOR PRODUCING TUBES OF POLYGONAL CROSS SECTION; **Re. 25,820,** J. M. Macchione, METHOD OF AND APPARATUS FOR PRODUCING TUBES OF POLYGONAL CROSS SECTION, **filed** Nov. 18, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c3333, *Precision Paper Tube Company et al.* v. *Highlander Paper Tube Company et al.*

3,128,557, J. E. Childs, REMOTE BIN LEVEL-INDICATING DEVICE, **filed** Jan. 20, 1975, D.C., N.D. Tex. (Fort Worth), Doc. CA 4–75–15, *Monitrol Manufacturing Company, Inc. and Monitor Manufacturing, Inc.* v. *Kodata, Inc.*

3,134,583, R. W. Wilson, APPARATUS FOR BULK CURING TOBACCO; **3,244,445,** APPARATUS FOR SUPPORTING TOBACCO LEAVES IN BULK FORM FOR CURING, **filed** Feb. 25, 1974, D.C., M.D. Fla. (Jacksonville), Doc. 74–124–C–J–R, *Powell Manufacturing Company, Inc.* v. *Suwannee Valley Gas, Inc.* Final judgment for plaintiff, Dec. 30, 1974.

3,182,164. (See 2,956,143.)

3,201,088, M. Long, SYSTEM FOR ELEVATING BUILDING COMPONENTS, **filed** Jan. 13, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c121, *Electronic Marketing, Inc. and Fidlar & Chambers, Inc.* v. *Computer Election Systems, Inc.*

3,207,342, P. J. Trojan, FRONT END LOADER, **filed** Jan. 27, 1975, D.C., W.D. Pa. (Pittsburgh), Doc. 75–123, *Asbury Industries, Inc.* v. *N. P. Nelson, Div. of Henry Spen and Company.*

3,210,267, Plank and Rosinski, CATALYTIC CRACKING OF HYDROCARBONS WITH THE USE OF A CRYSTALLINE ZEOLITE CATALYST CONTAINING RARE EARTHS AND A POROUS MATRIX; **3,436,357,** same, CATALYST AND CONVERSION OF ORGANIC COMPOUNDS IN THE PRESENCE THEREOF; **3,459,680,** same, CRYSTALLINE ZEOLITE COMPOSITE FOR CATALYTIC HYDROCARBON CONVERSION, **filed** Nov. 3, 1969, D.C., C.D. Calif. (Los Angeles), Doc. 69–633–F, *Mobil Oil Corporation* v. *Filtrol Corporation and Texaco Inc.* Judgment, plaintiff, Mobil take nothing with respect to its complaint and that said complaint is dismissed with prejudice. Counterclaimant Filtrol take nothing with respect to its antitrust counterclaim and that said counterclaim be and hereby is dismissed with prejudice. Defendant's declaratory judgment counterclaim is granted with respect to non-infringement of the claims specified, Dec. 9, 1974.

3,355,957, E. F. Peterson, ROTARY VIBRATOR AND MOUNT THEREFOR; **3,463,052,** C. G. Matson, VANE MOTOR, **filed** Jan. 6, 1975, D.C. Ark. (Little Rock), Doc. LR–75–C–5, *Martin Engineering Company* v. *Vibrators, Inc., Vibrators International, and Global Mfg.*

3,375,027. (See 2,740,027.)

3,399,501, W. E. Rossman, AUDITORIUM INSTALLATIONS, **filed** May 16, 1974, D.C. Nebr. (Omaha), Doc. CV 74–0–134, *The Macton Corporation* v. *The Board of Regents of the University of Nebraska.* Consent judgment and injunction, patent is valid. Defendant has infringed one or more of the claims of this patent and are permanently enjoined. Defendant is granted a paid-up license under the patent in suit, authorizing the construction and use of the office-classroom-auditorium building throughout the remaining term of said patent, Jan. 16, 1975.

3,415,322, S. W. Putch, EXPANDABLE BUSHING FOR WELL CASING HANGERS; **3,420,308,** same, WELL CASING HANGER, **filed** Oct. 9, 1974, D.C. Tex. (Houston), Doc. CA 74–H–1373, *FMC Corporation* v. *Stewart & Stevenson Services, Inc. and C. Jim Stewart and Stevenson, Inc.*

3,420,308. (See 3,415,322.)

3,436,357. (See 3,210,267.)

3,459,680. (See 3,210,267.)

3,463,052. (See 3,335,957.)

3,484,771, M. S. Falck, Jr., ALARM SYSTEM; **3,772,667,** same, EVENT SIGNAL TRANSMITTER HAVING EVENT SIGNAL DISPLAYING MEANS, **filed** Dec. 17, 1974, D.C. Oreg. (Portland), Doc. C–74–984, *Morse Products Mfg.* v. *Electronic Surveillance Corporation et al.*

3,518,604. (See 2,740,027.)

3,540,772, R. C. Weiler, CAMPER TIE DOWN, **filed** Nov. 21, 1974, D.C., C.D. Calif. (Los Angeles), Doc. 74–3422–DWW, *Raywood C. Weiler and Blackstone Manufacturing Co.* v. *L & M Products.*

3,574,332, C. C. Wetzel, TRAILER LIFTING AND DUMPING APPARATUS, **filed** Mar. 30, 1972, D.C., E.D. Mich. (Bay City), Doc. 3187, *Clifford C. Wetzel* v. *Frito-Lay, Inc.* Consent decree entered upon stipulation, plaintiff's patent is valid and has been infringed by defendant. Defendant is permanently enjoined from further infringement, Jan. 23, 1975.

3,596,899, J. B. Fulk, METHOD OF PRODUCING WEB UNITS, **filed** Sept. 12, 1974, D.C., E.D. Mo. (St. Louis), Doc. 74–638–C (4), *Paper Converting Machine Co., Inc.* v. *Stephens Press, Inc.*

3,622,487, Chand and Shaw, APPARATUS FOR MEASURING NITROGEN OXIDE CONCENTRATION; **3,622,488,** same, APPARATUS FOR MEASURING SULFUR DIOXIDE CONCENTRATIONS, **filed** June 12, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72–1322–DWW, *Dynasciences Corporation* v. *Arnold Miller, William N. Conner and Theta Sensors, Inc.* Filed judgment invalidating patents but ordering damages to plaintiff and against all defendants on plaintiff's unfair competition claim, entered Feb. 7, 1974.

3,622,488. (See 3,622,487.)

3,670,285. (See 2,740,027.)

3,672,187, E. C. Simpson, FABRIC, **filed** Jan. 24, 1975, D.C., S.D.N.Y., Doc. 75–C–366 CLB, *Polylok Corporation* v. *Steinberg & Neuman, Inc.*

3,722,399, J. E. Cole, POPCORN POPPER HAVING AUTOMATIC BUTTERING MEANS, **filed** Apr. 16, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c979, *Scovill Manufacturing Co.* v. *National Presto Industries Inc. et al.* Stipulation of dismissal and order thereon dismissing the complaint and the counterclaim without prejudice, Dec. 10, 1974.

3,731,442, K. Sandow, HEAT AND SMOKE VENT, **filed** Dec. 13, 1974, D.C. Tex. (Houston), Doc. CA 74–H–1650, *Plasteco, Inc.* v. *RCA Corporation.*

3,772,667. (See 3,484,771.)

3,776,379, E. M. Harvey, LUMBER SORTER, **filed** Oct. 29, 1974, D.C., M.D. Ala. (Montgomery), Doc. 74–344–N, *Edward M. Harvey* v. *Conveyor-Machinery Corporation et al.*

3,783,449, R. C. Davis, BULLET-PROOF PROTECTIVE ARMOR AND METHOD OF MAKING SAME, **filed** Sept. 16, 1974, D.C., C.D. Calif. (Los Angeles), Doc. 74–2686–WMB, *Second Chance Body Armor, Inc.* v. *Armor of America.*

3,799,532, W. L. Schlegel, ARTICULATED COIL SPRING CONNECTOR, **filed** Dec. 10, 1974, D.C. Del. (Wilmington), Doc. 74–264, *Komline-Sanderson Engineering Corporation* v. *Improved Machinery Inc.*

3,816,092, Wilson and McRae, HERBICIDAL 3,4-DICHLOROANILIDES, **filed** June 11, 1974, D.C., S.D. Tex. (Houston), Doc. 74–H–790, *Rohm and Haas Co.* v. *Dawson Chemical Co., Inc. et al.*

3,841,932, Forler and Heins, METHOD AND APPARATUS FOR REPAIRING CRACKS IN WINDSHIELDS, **filed** Jan. 17, 1975, D.C. Minn. (Minneapolis), Doc. 4–75–C–26, *The Glass Doctor, Inc.* v. *Hadley-West, Inc.*

3,846,779, J. G. Martner, ULTRASONIC TRANSDUCER, **filed** Jan. 17, 1975, D.C., N.D. Calif. (San Francisco), Doc. C–75–116 CBR, *Charles Galloway et al* v. *Unisec, Inc. et al.*

3,861,213, R. Parker, DIGITAL THERMOMETER AND METHOD OF MANUFACTURE, **filed** Jan. 21, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV–75–205–LTL, *RPR, Inc.* v. *Western Magnum Corporation.*

Re. 25,820. (See 3,120,158.)

D.222,984, Heltzen and Stone, MOTORCYCLE LUGGAGE CARRIER; **D. 223,070,** same, MOTORCYCLE LUGGAGE CARRIER AND BACKREST COMBINATION, **filed** Oct. 15, 1974, D.C., C.D. Calif. (Los Angeles), Doc. 74–2952–FW, *John H. Heltzen et al.* v. *Circle Industries.*

D. 223,070. (See D. 222,984.)

Trademark Registration Treaty Post Conference Information

The text of the Trademark Registration Treaty (TRT), signed in 1973 for the United States and thirteen other States, was reproduced in the OFFICIAL GAZETTE of July 24, 1973. Other documents and materials concerning the treaty were published in the OFFICIAL GAZETTES of March 12, 1974, May 28, 1974, and October 14, 1974.

The World Intellectual Property Organization (WIPO) has now circulated an additional post conference document, which contains a catchword index to the articles and rules of the Trademark Registration Treaty.

In the belief that this index is not of such general interest as those which were previously published, and in lieu of its publication herein, the Office will supply a photocopy of the catchword index (TRT/PDC/7, dated April 25, 1975) to any interested person who may request such copy.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Dated: May 23, 1975.

Certificates of Correction for the Week of June 17, 1975

Re. 28,373	3,782,528	3,840,388	3,856,738	3,861,929	3,867,873	3,871,983	3,874,808
D. 233,175	3,787,867	3,840,601	3,856,927	3,862,525	3,868,130	3,872,154	3,874,824
3,605,069	3,790,687	3,841,723	3,857,228	3,862,629	3,868,156	3,872,275	3,874,859
3,671,514	3,794,449	3,841,803	3,857,424	3,863,799	3,868,353	3,872,385	3,875,088
3,723,614	3,797,880	3,845,011	3,858,993	3,864,144	3,868,470	3,872,453	3,875,306
3,732,038	3,800,266	3,848,304	3,859,311	3,864,698	3,868,515	3,872,516	3,875,487
3,739,142	3,810,473	3,849,970	3,859,596	3,865,441	3,868,598	3,872,751	3,875,512
3,742,999	3,810,680	3,850,237	3,859,651	3,865,691	3,868,698	3,872,805	3,875,698
3,745,236	3,811,569	3,850,635	3,859,687	3,865,775	3,868,804	3,872,970	3,875,990
3,754,894	3,812,696	3,850,751	3,859,708	3,865,792	3,868,930	3,873,196	3,876,006
3,754,976	3,815,502	3,851,514	3,859,896	3,865,804	3,869,186	3,873,428	3,876,387
3,764,122	3,816,356	3,852,847	3,860,421	3,866,123	3,869,420	3,873,748	3,876,709
3,769,330	3,816,925	3,853,384	3,860,923	3,866,406	3,869,666	3,873,844	3,876,806
3,770,145	3,821,420	3,853,990	3,861,024	3,866,523	3,870,218	3,873,891	3,876,954
3,770,733	3,824,321	3,855,987	3,861,095	3,866,755	3,870,542	3,874,105	3,877,574
3,772,237	3,826,318	3,856,344	3,861,245	3,867,157	3,870,611	3,874,253	3,877,974
3,779,410	3,833,506	3,856,467	3,861,340	3,867,333	3,871,293	3,874,321	3,878,250
3,781,438	3,833,621	3,856,474	3,861,882	3,867,393	3,871,410	3,874,467	
3,781,967	3,838,068	3,856,499	3,861,908	3,867,413	3,871,487	3,874,675	

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 24, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-26-74
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-22-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-24-74
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-3-74
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-1-74
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	11-6-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-28-74
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-2-74
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	10-29-74
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-8-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	2-4-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	8-15-74
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	9-3-74
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. PULFREY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-30-74
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	8-9-74
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	10-29-74

Expiration of patents: The patents within the range of numbers indicated below expire during June 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents.—Numbers 2,836,826, to 2,840,820 inclusive
Plant Patents.—Numbers 1,714, to 1,721 inclusive

REISSUES

JUNE 17, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

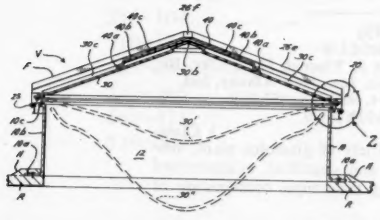
28,453
HEAT AND SMOKE VENT

Kiyoshi Sandow, Houston, Tex., assignor to Plasteco, Inc.

Original No. 3,731,442, dated May 8, 1973, Ser. No. 84,577, Oct. 28, 1970. Application for reissue Feb. 4, 1974, Ser. No. 439,054

Int. Cl. E04c *1/02;* E04d *1/30*

U.S. Cl. 52—232 9 Claims



1. A vent for heat and smoke adapted to be mounted on a roof of a building or like structure, comprising:

a. a curb adapted to be mounted on a roof and having a vent opening therethrough;

b. a heat softenable translucent or transparent synthetic resinous plastic vent cover means which is capable of softening and sagging when heated under predetermined conditions for sagging and dropping out of the vent opening to open same and allow heat and smoke to escape through the vent from the area in the building therebelow;

c. mounting means for releasably mounting said vent cover means on said curb; and

d. a shield disposed over only the central portion of said vent cover and insulating same from cooling by rain falling thereon, thereby allowing the vent cover to soften and deform under said predetermined heating conditions so as to automatically disengage said cover from said mounting means for opening the vent to allow heat and smoke to escape.

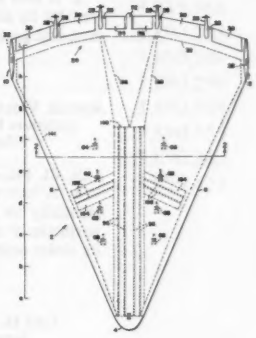
28,454
AIRSHIP

John R. Fitzpatrick, Levittown, Pa., and Juergen K. Bock, Delmenhorst, Germany, assignors to Aereon Corporation, Trenton, N.J.

Original No. 3,486,719, dated Dec. 30, 1969, Ser. No. 687,845, Dec. 4 1967. Application for reissue Dec. 23, 1971 Ser. No. 211,595

Int. Cl. B64b *1/20, 1/30*

U.S. Cl. 244—25 8 Claims



7. An aircraft with combined aerodynamic and aerostatic lift comprising an enclosed hull, the major volume of which is filled with a lighter-than-air gas, said hull being characterized by a delta-shaped planform substantially symmetrical about a plane extending from a narrow nose at one corner of the planform to the mid-point at the wide end of the planform opposite the nose, ellipse-like cross-sections transverse to said plane throughout substantially all of its length, a maximum height dimension in said plane perpendicular to the chord in said plane at a point spaced from said wide end and spaced from the nose, said ellipse-like cross-sections progressively increasing in width measured perpendicularly to said plane and progressively decreasing in height, measured in said plane, throughout substantially the entire distance from the cross-section at the point of maximum height toward said wide end.

PLANT PATENTS

GRANTED JUNE 17, 1975

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,730

FOUR LEAF CLOVER PLANT

Ellis H. Dearing, Tulsa, Okla., assignor of fractional part interest to Otto Duane Terrell, Norco, Calif.

Substituted for abandoned plant patent application Ser. No. 843,123, Aug. 6, 1969. This application Feb. 22, 1973, Ser. No. 334,661

Int. Cl. A01h *9/00*

U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct variety of pepperwort characterized by its ability to grow in soil of ordinary water content, and great robustness.

3,731

GLADIOLUS

Harold Vincent and Herbert J. Vincent, Rock City, Ill., assignors to Selected Glads, Inc., New Albany, Ind.

Filed Mar. 18, 1974, Ser. No. 452,289

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—85 **1 Claim**

1. A new and distinct variety of gladiolus plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its violet color.

3,732

GLADIOLUS

Carl H. Fischer, St. Charles, Minn., assignor to Selected Glads, Inc., New Albany, Ind.

Filed Mar. 18, 1974, Ser. No. 452,290

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—85 **1 Claim**

1. A new and distinct variety of gladiolus plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its unique color, which is predominantly red, and its early blooming habit.

PATENTS

GRANTED JUNE 17, 1975

ERRATA

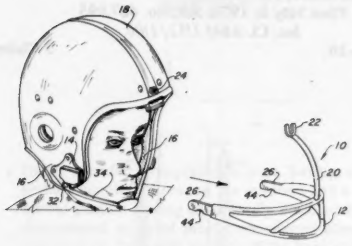
For CLASS	See PATENT NO.
228–173	3,889,349
032–012	3,889,385
090–078	3,889,573
125–016	3,889,699
169–049	3,889,738
169–059	3,889,752
266–024	3,889,864
200–150R	3,890,258
210–104	3,890,289
210–136	3,890,290
425–242	3,890,308
250–366	3,890,355
060–431	3,890,360
310–008.3	3,890,423

PATENTS

GRANTED JUNE 17, 1975

GENERAL AND MECHANICAL

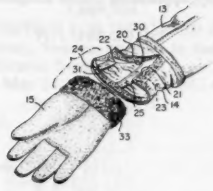
3,889,296
TEAR-AWAY FACE MASK SUBASSEMBLY FOR FOOTBALL HELMETS
Edwin M. Martin, Rt. 1, P.O. Box 37, Las Animas, Colo. 81054
Filed Feb. 13, 1974, Ser. No. 442,066
Int. Cl. A42b *1/08*
U.S. Cl. 2—9 **1 Claim**



1. A tear-away face mask assembly for football helmets and the like which comprises: a pair of bracket-forming members each having a channel formed therein effective when mounted in transversely-spaced opposed relation to one another upon the exterior face of the earflaps of a football helmet to cooperate therewith and define substantially parallel forwardly-opening sockets alongside thereof; a face mask having a horizontally-arched portion with the terminal ends thereof shaped to define a pair of transversely-spaced parallel tongues positioned and adapted for simultaneous insertion into the sockets in the bracket members and a vertically-disposed upwardly and rearwardly-curved arcuate strut depending from the midpoint of said arched portion terminating at the forehead-covering portion of the helmet when attached thereto, said sockets and tongues when interengaged cooperating to produce a quick-disconnect coupling therebetween operative to permit instantaneous detachment of the mask upon application of a pulling force thereto in a direction to separate same from the helmet; and, a quick-disconnect coupling connecting said terminal strut end to said helmet, said coupling comprising a pin mountable upon the forehead-covering portion of the helmet in position to receive the terminal end of the strut and an upwardly extending generally U-shaped yoke formed on said strut end positioned to receive said pin.

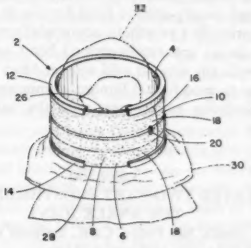
3,889,297
PROTECTIVE WEARING APPAREL
Theodore Lee Jarboe, 505 Boston Ave., Takoma Park, Md. 20012, and Connie Dean Groseclose, 7105 Decatur St., Hyattsville, Md. 20784
Filed Sept. 11, 1974, Ser. No. 504,959
Int. Cl. A41d *13/08*
U.S. Cl. 2—16 **7 Claims**

1. Protective wearing apparel comprising a two-piece combination, one of said pieces consisting of a coat, and the other of said pieces consisting of gloves for the hand, the sleeves of said coat being split longitudinally along a line extending through the cuff portion of the sleeve, the ends of said split portion, and the circumferential boundary of said cuff portion having narrow strips of Velcro material affixed thereto, the open end of said glove having affixed to the outer surface



thereof a band of Velcro material completely encircling said open end.

3,889,298
HAIR BAND PROTECTOR
Stefania Miska, 12349 S. Bishop, Calumet Park, Ill. 60643
Filed Apr. 29, 1974, Ser. No. 465,113
Int. Cl. A42b *1/24*
U.S. Cl. 2—174 **4 Claims**

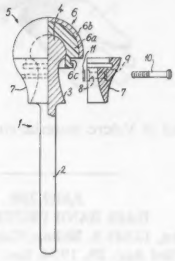


1. A hair protector band comprising an elongated flat strip defining an upright wall of thin cross section, said wall having inner and outer wall surfaces, interlocking means located on the outside of said wall and at opposite end portions of the wall, said strip being encirclable upon itself to define a circle band position for encirclement about a head of hair of a user and said strip being extendable to an elongated length position for storage, said wall having a first upright wall surface on one side thereof and having a second upright surface on the other side thereof, said first wall surface in the circle band position being an inner wall surface for facing the hair and said second wall surface in the circle band position being an outer wall surface for embracement by a garment adapted to be sleeved thereabout, said interlocking means coupling the opposite end portions of the strip in the circle band position, said interlocking means comprising channel means on the outside upper and lower edges at one end portion of the wall and said other end portion of the wall having upper and lower edges spaced apart to fit between said channel means, said channel means of said one end portion telescopingly receiving the upper and lower edges of the other end portion with attendant overlap of said one end portion by said other end portion, said inner wall surface being smooth and said outer wall surface being rough, said smooth surface of said one end portion facing and opposing said rough surface in the band position of the strip whereby said surfaces are readily slidable along each other accommodating unimpeded circumferential adjustments of the band.

3,889,299
PROSTHETIC HIP JOINT DEVICES

Geoffrey Vaughan Osborne, and Roger Gilbert Rowland, both of Southport, England, assignors to National Research Development Corporation, London, England

Filed Jan. 7, 1974, Ser. No. 431,553
Claims priority, application United Kingdom, Jan. 12, 1973, 1790/73
Int. Cl. A61f 1/24
U.S. Cl. 3—1 10 Claims

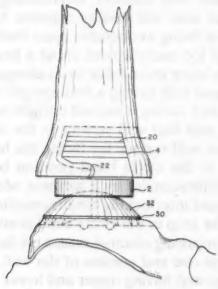


9. A prosthetic hip joint device comprising:
a femoral head replacement component having a relatively small spherically-shaped head for use in articulating engagement with a prosthetic acetabular socket component; and a larger spherically-shaped head assembly secured concentrically around said smaller head in demountable manner to modify said femoral component for initial use in articulating engagement with the natural acetabular socket.

3,889,300
ARTICULATED TWO-PART PROSTHESIS REPLACING THE ANKLE JOINT

Richard C. Smith, San Pedro, Calif., assignor to Wright Manufacturing Company, Arlington, Tenn.

Filed Aug. 28, 1974, Ser. No. 501,296
Int. Cl.[2] A61F 1/24
U.S. Cl. 3—1.91 3 Claims

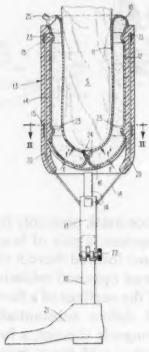


1. A two-part prosthetic device for arthoplasty of the human ankle joint, comprising a tibial component for replacing at least a part of the prepared distal end of the tibia, and a talar component for replacing at least a part of the prepared proximate surface of the talus, the tibial component comprising a base part having a downwardly facing concave surface of part-spherical shape and a part extending upwardly from the base part and having spaced side walls extending in an anterior-posterior direction when implanted and having a notch in its distal posterior base to receive an osteotomy slot prepared in the distal tibia to lock the component in place, the talar component comprising a base part having an upwardly facing convex surface which is part-spherical in shape and has the same radius of curvature as that of the concave surface of the tibial component and on which the concave surface rests when the two-part prosthesis is in place, and means on the lower surface of the talar component for engaging into the bone of the talus to increase the connection of the component thereto.

3,889,301
THERAPEUTIC STUMP TREATING AIR SAC PROSTHESIS

Francis J. Bonner, Sr., Ardmore, Pa., assignor to Marion K. Bonner. Ardmore, Pa.

Filed May 6, 1974, Ser. No. 467,095
Int. Cl. A61f 1/12, 1/08
U.S. Cl. 3—20 3 Claims



1. In a prosthetic device for therapeutic treatment of an amputative stump, the combination which comprises means providing an air sac shaped for arrangement in intimate contact with the sides and bottom of the amputative stump, said air sac being essentially empty except for said air, and being internally open and unimpeded with respect to flow of air from place to place within said sac, means for introducing air into said sac for maintenance of said air under pressure therein, said air sac having an internal and an external side wall which are shaped downwardly and inwardly in a manner to provide an air space which is adapted to wrap substantially around the distal end of the stump, means for providing a substantially rigid casing surrounding and confining said air sac, and supporting means for said casing, wherein said air sac has a sealed distal end adapted to be located in the area of the distal end of the amputative stump, and wherein a shock-absorbing resilient supporting means is provided extending under and in contact with said distal end of said air sac, and arranged to exert a force against said distal end in a direction to urge it upwardly toward and against said distal end of said stump.

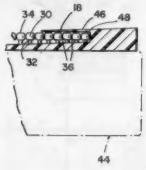
3,889,302
FLUID DISCHARGE UNIT

Marta Carlota Ketterer, and Victor Garcia Ketterer, both of 704 Bush St., No. 209, San Francisco, Calif. 94108

Filed May 13, 1974, Ser. No. 469,198
Int. Cl. A61g 9/00
U.S. Cl. 4—110 5 Claims

1. A fluid discharge unit adapted to be placed on top of the mattress of a bed to collect fluids and discharge them into a container, said unit comprising:

a two-dimensional array of mushroom-shaped elements, each said element comprising a relatively wide head portion having a substantially circular planar section and a relatively narrow neck portion, the head portion of each element being in close abutment with the head portion of each adjacent element, said head portions each having an inwardly tapered upper section terminating in a flat upper surface so that said elements in combination provide a discontinuous upper surface adapted to support an individual lying on the bed but allow for drainage of fluids through the interstices between the elements; and



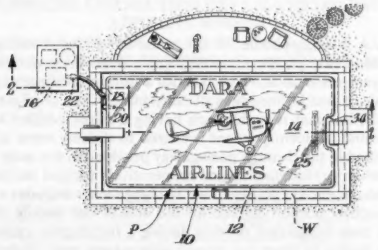
a frame member comprising a base having a flat lower surface adapted to rest on the mattress and a raised perimetral portion having an inwardly directed lip, the two-dimensional array of mushroom-shaped elements being mounted on the upper surface of the base and extending below said lip at the marginal portions of said array, the upper surface of said base having a slightly V-shaped cross-section in one transverse direction so that fluids drained through the interstices between the mushroom-elements are collected at the median of the upper surface of said base, said raised perimetral portion having fluid discharge means at said median for discharge of the fluids into the container.

3,889,303

DISPLACEABLE SWIMMING POOL COVER

Augustus B. Kinzel, 1738 Castellana Rd., La Jolla, Calif. 92037

Filed Mar. 27, 1974, Ser. No. 455,144
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.13 **13 Claims**



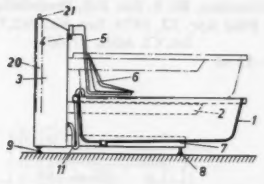
1. A displaceable covering device for a swimming pool comprising a cover sheet of a size and to fit within and cover a substantial area of the pool, said cover sheet being substantially vertically movable to and from a first position near the water surface of the pool and a second position well below the water surface, said cover sheet being substantially airtight, means for feeding air beneath said cover sheet at sufficient pressure to cause said cover sheet to rise to create a floating air bubble housing the lower portion of which is formed generally at the level of and in cooperation with the water surface, means to expel the air under said cover sheet to create a deflated condition of said cover sheet, means weighting down said cover sheet when in the deflated condition to cause said cover sheet to sink to said second position, a frame shaped to fit within and generally conforming to the shape of the pool, said cover sheet being secured to said frame, said frame being movable with said cover sheet whereby said frame and said cover sheet together comprise a covering unit, and said means for feeding air being disposed under said cover sheet at a location other than its attachment to said frame.

3,889,304

BATHING DEVICE FOR INVALIDED PERSONS

Jan Loren, Goteborg, Sweden, assignor to Soderberg Tollam AB, Vastra Frolunda, Sweden

Filed May 24, 1973, Ser. No. 363,408
Int. Cl. A47k *3/12*
U.S. Cl. 4—185 L **1 Claim**



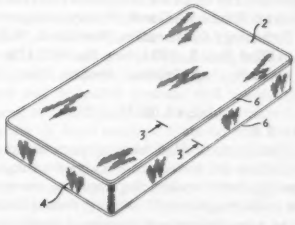
1. A lifting and lowering mechanism for baths of the type intended for invalided persons and including a bath tub and a platform for carrying the person to be placed in the tub, said lifting and lowering mechanism comprising a pressure fluid operated piston and cylinder unit to be used for alternate lifting and lowering of the bath tub or the carrying platform respectively, in which there are provided two vertical guide members, two plates movable vertically along the guide members, a cross beam attached to the two plates, the piston of the piston and cylinder unit being fixedly connected to the cross beam, said plates extending sideways outside said guide members, a horizontal bracket for supporting the tub, each of the plates being provided with means for removably securing the horizontal bracket, a vertical stanchion, each of said plates having at its extended portion means for attachment of the vertical stanchion and means for removably, pivotally fitting said carrying platform to an upper part of said stanchion.

3,889,305

HEAT BARRIER TEXTILE MATERIAL

Irving Goldberg, 5 Windham Rd., Rockville Centre, N.Y. 11570

Continuation-in-part of Ser. No. 305,670, Nov. 13, 1972, abandoned. This application July 30, 1973, Ser. No. 384,049
Int. Cl.[2] A47C *23/00, 27/00*
U.S. Cl. 5—345 R **10 Claims**



1. As an article of manufacture, a mattress having a vertical surface mattress ticking and a horizontal surface mattress ticking meeting to substantially form an edge, an organic heat barrier mattress tape edging adjacent said edge and joining means securing said tape edging to said edge, said tape edging being made of an organic fabric from at least about 50% by weight of at least one member of the group of mono-filaments

and filament yarn, and optionally, the balance spun yarn, said mono-filaments and filament yarn and said spun yarn being made of a synthetic fiber forming polymer selected from at least one member of the group consisting of a poly(ethyleneglycol terephthalate), polyamide, polyacrylonitrile and polyolefin, the loft of said fabric being such that the ratio of the average thickness of said fabric to the combined average thickness of said monofilaments, filament yarn or spun yarn is from about 2.5 to about 4.5:1, the weight of said fabric being from about 6 to about 20 ounces per square yard.

3,889,306

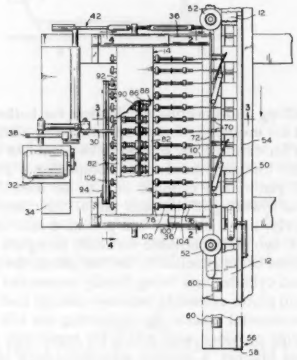
BEE BOARD CLEANER

Phillip W. Geertson, Rt. 1, Box 268, Homedale, Idaho 83628

Filed Apr. 22, 1974, Ser. No. 462,723

Int. Cl. A01k *51/00*

U.S. Cl. 6—12 M **15 Claims**



1. In a bee board cleaner,

an elongated reamer,

means for rotating the reamer on its longitudinal axis,

and means for resiliently pressing the reamer to a bee board having holes therein, the reamer entering one of the holes if the forward end of the reamer is substantially aligned therewith and merely engaging the adjacent face of the bee board if not substantially aligned with said one of the holes.

3,889,307

REMOTE-CONTROLLED UNDERWATER BUOY

Georges Sylvain Houot, La Garde, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

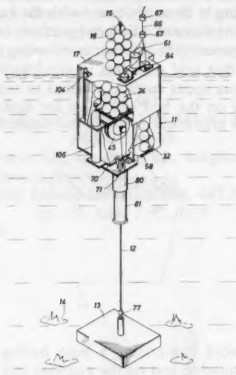
Filed Jan. 9, 1974, Ser. No. 432,126

Claims priority, application France, Jan. 12, 1973, 73.01003

Int. Cl. B63b *21/52*

U.S. Cl. 9—8 R **17 Claims**

1. A remotely controlled buoy apparatus adapted to be submerged below the surface of a body of water, comprising: a body having thrust means for applying an upward force thereto; an anchoring element; latching means for maintaining said body in a predetermined immersed position relative to said anchoring element; remotely controlled means for releasing said latching means to allow said body to be moved upwardly to the surface of the water by said thrust means; a drum rotatably mounted and enclosed within said body; a line wound on said drum and having one end extending from said body and fixed to said anchoring element so as to unwind from said drum when said body is moving upwardly; a motor releasably attached to the exterior of said body; and transmission means connected between said motor and said drum for enabling said motor to wind said line on said drum, thereby moving said body downwardly within said water to the predetermined immersed position therein.



3,889,308

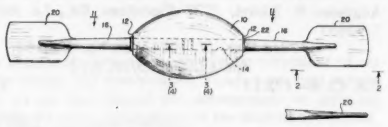
FLOATING PADDLE

Henry Persson, Bloomfield, N.J., assignor to Thomas W. Sibilia, Bloomfield; Montero Cariani, Nutley and Richard K. Knorr, Cedar Grove, all of, N.J.

Filed Nov. 15, 1973, Ser. No. 416,066

Int. Cl. A63b *31/06*

U.S. Cl. 9—307 **2 Claims**

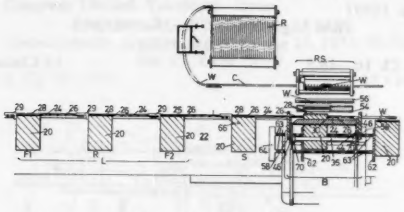


1. A floating paddle for use while swimming, boating and the like, said paddle including: (*a*) a main body member of buoyant material and formed with a through passageway; (*b*) a pair of paddle members of substantially like configuration and of buoyant material each having a shank portion whose ends and adjacent portions are sized to slidably enter and be retained in the through passageway provided in the main body member; (*c*) latching means cooperatively formed on each of the shank ends of paddles, said latching means includes a male projection portion formed on the end of one paddle shank, said male projection portion having a rectangular cross section having at least two sloped sides which taper slightly toward the distal end, the projection terminating on one side at its inner end with a formed undercut; the other paddle shank having its distal end formed with a U-shaped projection which includes one leg adapted to mate with one of the sloped sides of the male tapered projection of the shank end of the other paddle and with the other projection portion of the U-shape having a hook-like projection adapted to engage the opposite sloped side of the male tapered projection until full engagement of the ends is achieved whereat the hook-like portion enters the undercut in the other shank member end to achieve an interlock of the paddle shanks within the through passageway of the paddle body member, and (*d*) retaining means cooperatively formed on said shank portions of the paddles and the main body to establish and maintain said body at a determined linear position on said shank portions as and after the paddles are brought into interlocked condition.

3,889,309
MACHINES FOR BINDING PACKETS OF PERFORATED SHEETS

Sidney George William Adams, Walton-on-Thames, and Edgar Horace Galliford, Esher, both of England, assignors to James Burn Bindings Limited, Surrey, England

Filed Jan. 21, 1974, Ser. No. 434,990
Claims priority, application United Kingdom, Jan. 23, 1973, 3498/73
Int. Cl. B42c *19/08*
U.S. Cl. 11—1 A 4 Claims



1. A machine for binding a packet of perforated sheets into book form, said packet being so bound by a wire binding element closed through the perforations in said packet, said machine including

an endless chain movable between a loading station and a binding station, said endless chain having projections adapted to engage the perforations of the sheets of said packet,

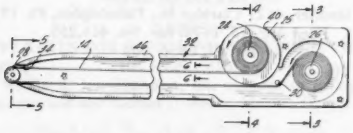
a closing device located adjacent to said binding station, said closing device being adapted to bind the sheets of said packet with said wire binding element, and

lift means located at said binding station, said lift means being operable to remove said packet from the projections of said chain, and said lift means being movable to present said packet into operative relation with said closing device.

3,889,310
TYPEWRITER CORRECTION DEVICE EMPLOYING AN ADHESIVE RIBBON

Victor Barouh, 935 Plum Tree Rd. W., Westbury, N.Y. 11568, and Robert Glenn, 70-20 108th St., Forest Hills, N.Y. 11375

Filed Nov. 23, 1973, Ser. No. 418,423
Int. Cl. B41j *29/26;* B43l *19/00*
U.S. Cl. 15—210 R 2 Claims

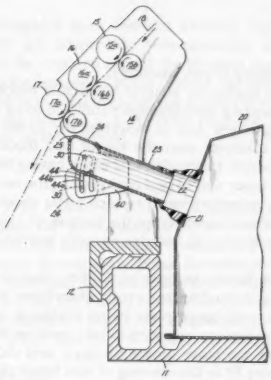


1. Typewriter correction device adapted to be hand held comprising an elongated casing having a broad end and a tapered end, rotatable cylindrical rollers in said broad end comprising a winding roller and storage roller mounted on parallel axes, said winding roller being positioned forwardly of said storage roller toward the tapered end of said casing, a portion of said winding roller extending outwardly of said casing through an opening therein, an opening in the tapered end of said casing, an applicator roller rotatably mounted in said opening and extending partially outward of said opening and a correction ribbon having an adhesive coating facing outwardly, said ribbon being entrained on said rollers in such manner so that the winding end storage rollers rotate in the same direction for winding and guiding said ribbon into said tapered end opening, said device including guide means for positioning said ribbon in horizontal alignment with said applicator roller.

3,889,311
FLUTE SUSPENSION PLATE

John P. Kieronski, and Richard F. Keon, both of Charlotte, N.C., assignors to Whitin Machine Works, Incorporated, Whitinsville, Mass.

Filed Sept. 24, 1973, Ser. No. 399,686
Int. Cl. A47l *5/38*
U.S. Cl. 15—306 A 10 Claims

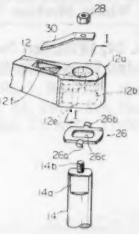


1. A textile machine comprising a frame, a vacuum source, a plurality of longitudinally spaced pairs of rolls disposed on said frame and having an inlet side and a discharge side, a longitudinally extending suction flute operatively connected to said vacuum source for removing broken fibers and lint from said rolls, mounting means mounting said suction flute on said frame for movement along a predetermined path between an operating position adjacent said discharge side of said rolls and a retracted position spaced from said rolls, said mounting means including a stud carried by said suction flute and movable with said suction flute between said operating position and said retracted position and a suspension plate rigidly secured to said frame, said suspension plate being a one piece flat plate of hard resilient material and having an inverted U-shaped opening defining a movable cantilever tongue portion having a fixed end and a free end, said inverted U-shaped opening extending completely through said suspension plate and including a first leg portion and a second leg portion and a bight portion extending between said leg portions, said first leg of said inverted U-shaped opening slidably receiving said stud and defining said path, said free end of said movable tongue portion being resiliently movable between a first position and a second position when said stud is moved between said operating position and said retracted position, and said free end of said tongue portion being displaced into said second leg portion when said tongue is in one of said tongue positions.

3,889,312
HEADLAMP WIPER ASSEMBLY

Noboru Fukasawa, Kamakura, and Kyoji Kobayashi, Chigasaki, both of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed June 27, 1973, Ser. No. 374,124
Int. Cl. B60s 1/34
U.S. Cl. 15—250.34 1 Claim

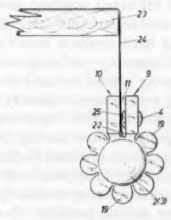


1. In a headlamp wiper, assembly,
a wiper arm having an integral block said block having a cavity extending therethrough paralleled to an axis about which said wiper arm is movable, the cavity being reduced in diameter near the top of said block and thus forming therein a shoulder, said block having two grooves formed in inner wall of said cavity, said grooves extending and being spaced opposite to each other about the vertical axis of said cavity from the bottom of said block to portions adjacent to but downwardly spaced from said shoulders;
a hinge plate having an opening formed therethrough and projections extending outwardly therefrom in opposite directions, said hinge plate being fitable in said cavity with its projections engaging in said grooves so that said hinge plate can move until it abuts on said shoulder;
a spindle being fit in the opening of said hinge plate so that upon rotation of the spindle the wiper arm will be rotated by said hinge plate in the same direction;
a plate spring strip bridging over the opening in the top of said block, at which said reduced bore portion terminates, said plate spring engaging the wiper arm; and
means for fastening said plate spring strip to said top of said spindle such that said plate spring urges said wiper arm to effect a blade bias force.

3,889,313
CLOTH WEIGHT

Martin Henry Hulthen, Helsingborg, Sweden, assignor to Aktiebolaget Henry Hulthen, Halsningborg, Sweden

Filed Oct. 16, 1974, Ser. No. 515,215
Int. Cl. A47g 1/10; E05b 1/00; E05f 1/00, 7/00
U.S. Cl. 16—1 4 Claims

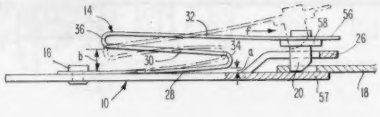


1. An improved cloth weight for attachment to the edge of that part of a cloth that hangs down from the table, the improvement comprising two hollow semispherical members, a ball-shaped weight, said two semisphere members enclosing said weight, a pair of projecting arms on each semisphere member, a gap formed between said arms, a clamping wheel rotationally mounted in one of said arms, trunnions arranged in eccentric relationship on said wheel, a portion of the periphery of said clamping wheel extending into said space between said arms.

3,889,314
HEAT ACTUATED LINK

Francis J. McCabe, Apt. A-4, North and East Sts., Doylestown, Pa. 18901

Filed Aug. 30, 1974, Ser. No. 501,867
Int. Cl.² E05F 15/20
U.S. Cl. 16—48.5 12 Claims

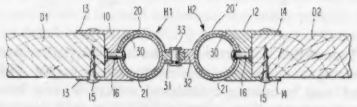


12. A releasable fire link comprising a releasable member and a gripping means for normally engaging said releasable member and for releasing said releasable member in response to the heating of said gripping means, said gripping means comprising a serpentine bimetallic element and a mounting element, said bimetallic element having a base portion connected to said mounting element, a mid-portion extending back over at least a part of said base portion, an end portion extending back over said mid-portion, and a tip portion comprising a substantially planar extension of said end portion and having a pin protruding therefrom which in the normal position coacts with said mounting element to directly engage said releasable member, and wherein the axis of said pin is substantially perpendicular to the plane of said tip portion, and wherein the plane of said tip portion and the plane of said mounting element in the normal position converge slightly towards said releasable member wherein the plane of said tip portion and the plane of said mounting element in the heated position are non-convergent towards said releasable member and wherein said bimetallic element is formed from a bimetallic strip having a maximum width at the point of connection between said base portion and said first element and a minimum width at said tip and wherein said bimetallic strip is tapered uniformly along its length.

3,889,315
SAFETY DOOR HINGE

Wilfred Stouffer, 4127 Claridge St., Philadelphia, Pa. 19124

Filed Apr. 15, 1974, Ser. No. 461,255
Int. Cl. E05d 1/04
U.S. Cl. 16—178 9 Claims



1. A door hinge comprising:
a. an elongated vertical stationary tubular connector having horizontal slots at spaced intervals along the length of said connector;
b. an elongated cylindrical insert pivotal within said stationary connector;
c. an elongated vertical support casing having means along one edge for receiving an edge of door panel and having

means along its opposite edge for receiving said stationary tubular connector;

d. fastening means extending through said slots in said stationary tubular connector for fastening said casing to said pivotal cylindrical insert;

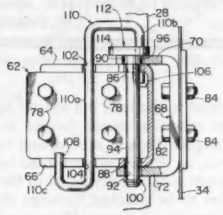
e. elongated flange means extending radially from said stationary tubular connector for securing said connector to an adjacent stationary support.

3,889,316

HINGE ASSEMBLY FOR A VEHICLE DOOR

Shyouichi Koike, Tokyo, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed June 24, 1974, Ser. No. 482,626
Claims priority, application Japan, June 25, 1973, 48-75423
Int. Cl. E05d *11/10*
U.S. Cl. 16—145 **10 Claims**



1. A two-stage checking hinge assembly for a door structure of an automotive vehicle comprising, in combination, a body-side hinge bracket fixedly mounted on a vehicle body structure defining an opening for the door structure, a door-side hinge bracket fixedly mounted on the door structure and positioned in association with the body-side hinge bracket, a hinge pin fixedly mounted on the door-side hinge bracket and pivotally supported on the body-side hinge bracket for permitting the door-side hinge bracket and the door structure to turn about an axis of the hinge pin, a cam member fast on the hinge pin and having first, second and third recessed flanks which correspond respectively with closed, half-open and fully-open positions of the door structure, and a torsion spring which is anchored at one end to the body-side hinge bracket and at the other end to the door-side hinge bracket and which is engageable with the first, second and third recessed flanks of the cam member for biasing the door structure into any of the closed, half-open and fully-open positions depending upon the rotational position of the hinge pin relative to the body-side hinge bracket.

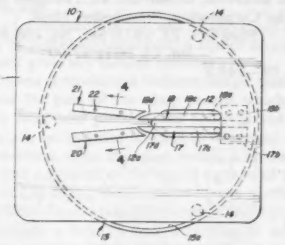
3,889,317

APPARATUS FOR REMOVING A STERNUM FROM A CHICKEN CARCASS

Roy W. Boyd, Jr., Elmhurst, Ill., assignor to Irving Rosen, Lincolnwood and Gerald J. Rosen, Morton Grove, both of, Ill.

Filed Nov. 29, 1973, Ser. No. 419,937
Int. Cl. A22b *3/08*
U.S. Cl. 17—11 **9 Claims**

1. An apparatus for removing only a sternum from an eviscerated, uncooked chicken carcass which has been slit longitudinally, spread apart and disposed in an inverted position so as to expose the sternum, ribs and adjacent portions of the carcass, said apparatus comprising a fixed supporting surface on which the inverted spread apart carcass is adapted to be slidably mounted, said surface being provided with a single elongated opening sized to permit passage therethrough of the sternum subsequent to being separated from the remainder of the carcass while the integrity of the latter is preserved; and an elongated fixedly mounted element protruding from a first end of said opening and curving upwardly therefrom towards an opposite second end of the opening and terminating adjacent thereto whereby a substantial portion of said element is exposed and is disposed in overlying spaced registered relation with respect to said surface opening, the end of said element adjacent said opening second end being tapered and provided



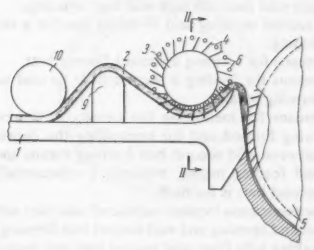
with an elongated open end slot whereby segments of said slotted end are adapted to simultaneously engage spaced portions of the exposed end of the sternum and separate the latter from the remainder of the carcass, the integrity of which is preserved as the carcass is moved across the surface longitudinally of the opening in a direction from the second end to the first end of the opening.

3,889,318

DEVICE FOR FEEDING LAP OF FIBRES TO CARDING MEMBER OF RINGLESS SPINNING APPARATUS

Albert Arturovich Leinek, ulitsa Sovetskaya, 111, kv. 39; Igor Stepanovich Khomyakov, ulitsa Sovetskaya, 125, kv. 23, both of Kostroma; Igor Serafimovich Privalov, ulitsa Karla Marxa, 12, kv. 18, Penza, and Galina Pavlovna Filaretova, ulitsa Sovetskaya, 111, kv. 31, Kostroma, all of U.S.S.R.

Filed Jan. 25, 1974, Ser. No. 436,729
Int. Cl. D01g *15/40*
U.S. Cl. 19—105 **3 Claims**



1. A device for feeding a lap of fibres to the carding member of an apparatus for ringless spinning of fibres, comprising: a feed plate adapted to support thereon a tensioned lap of fibres; a driven roller with needles, arranged above said feed plate and defining therewith a feed-in couple, said needles being adapted for cooperation with said lap to feed said lap at rotation of said feed roller toward said carding member; a plurality of resilient rods arranged adjacent to the external surface of said feed roller, extending along the generatrix thereof intermediate of said needles; a pair of supports mounted on said feed roller and supporting said resilient rods therebetween; each said rod having one end thereof rigidly secured in one of said supports and having the other end thereof supported by the other one of said supports for free displacement thereof along the generatrix of said feed roller, to provide for gradual resilient bending in of said rod upon engagement thereof with said lap, whereby there is produced

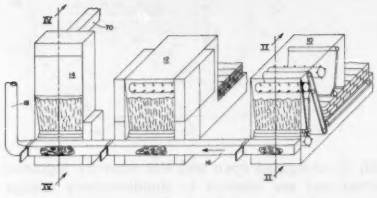
an effort tending to move said lap off said needles of said feed roller.

3,889,319

METHOD AND SYSTEM FOR PRODUCING BLENDED TEXTILE FIBROUS MATERIALS

James H. Roberson, Greenville, S.C., assignor to Crompton & Knowles Corporation, Worchester, Mass.

Filed Oct. 23, 1973, Ser. No. 408,951
Int. Cl. D01g *13/00*
U.S. Cl. 19—145.5 **8 Claims**



1. A system for producing blended textile fibrous materials comprising:

I. an elongated duct having a first side opening and a second side opening spaced from said first opening lengthwise of said duct;

II. a first opening and blending line for a first fiber including:

a. means for forming a first fibrous batt;

b. means for feeding a first fiber to said first batt forming means;

c. means for measuring the density of the batt as it is being formed and for controlling the density of fiber between said first batt forming means and said first feeding means, whereby a substantially uniform first batt is formed; and

d. beater means located outside of said duct adjacent said first opening and said first batt forming means for pulling tufts from said first batt and propelling them into said duct through said first opening;

III. a second opening and blending line for a second fiber including:

a. means for forming a second fibrous batt;

b. means for feeding a second fiber to said second batt forming means;

c. means for measuring the density of the batt as it is being formed and for controlling the density of fiber between said second batt forming means and said second feeding means, whereby a substantially uniform second batt is formed;

d. beater means located outside of said duct adjacent said second opening and said second batt forming means for pulling tufts from said second batt and propelling them into said duct through said second opening; and

IV. means for creating a negative pressure in said duct to create an air flow from said first opening to said second opening, whereby tufts of fibers from said first batt are blended with tufts of fibers from said second batt.

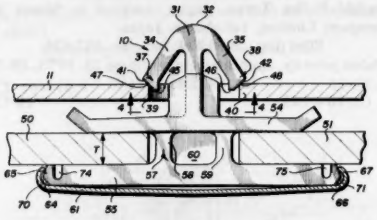
3,889,320

HEADLINER/MOLDING RETAINER AND METHOD OF INSTALLING SAME

Richard Allen Koscik, Richton Park, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Apr. 1, 1974, Ser. No. 456,818
Int. Cl.[2] **A44B** *21/00;* **F16B** *19/00*
U.S. Cl. 24—73 PM **11 Claims**

1. A one-piece headliner retainer adapted to be applied to an aperture-defining structure such as an auto roof, the aperture being symmetrical about two mutually perpendicular axes, the retainer including a bi-ended spacer adapted to extend along a first aperture axis, each spacer end adapted to abut aperture-defining structure adjacent the first aperture axis, a stem projecting from the spacer, at least one wing extending away from the stem and having a free end adapted to abut aperture-defining structure adjacent a second axis, a rectangular, laterally extending leaf extending the length of the spacer and carried in substantially fixed relation to the spacer on a side opposite the stem, a rectangular shoe oriented



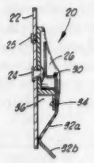
substantially parallel to the leaf, but spaced apart therefrom, molding member retention means formed on two opposite sides of the rectangular shoe to receive and retain a molding member thereover, an extension interposed between the leaf and shoe of a height substantially equal to the thickness of a headliner member to be pinched between the leaf and the shoe, and recess structure interposed between the leaf and the spacer to locate the leaf at a position spaced apart from the auto roof, whereby flexibility between the leaf, the auto roof and the spacer is provided.

3,889,321

TIE DOWN BRACKETS FOR SECURING BIGHTS OF FLEXIBLE MEMBERS

Willard W. Moser, Box 1503, Guymon, Okla. 73942

Filed Jan. 7, 1974, Ser. No. 431,205
Int. Cl. A43c *3/0;* **B21d** *53/46;* **A44b** *13/02*
U.S. Cl. 24—146 **4 Claims**



4. A tie down bracket for engaging a bight in a flexible member comprising:

a base plate;

a spring supporting body secured to said base plate and including:

a flat back surface bearing flatly against said base plate;

a dished-out central portion on the side of the body opposite said flat back surface formes in part by side walls;

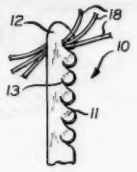
a retainer finger projecting from said central portion as a cantilever, and spaced from, and extending substantially parallel to the planes of said flat back surface and said base plate, said finger defining with said base plate an opening to the space between the finger and base plate;

a retainer pin extending through said side walls and across said dished-out central portion;

spring means mounted on said body and including:

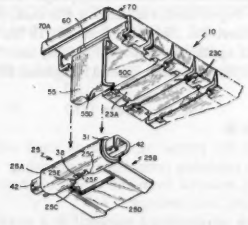
a load bearing portion bearing against said body;
an intermediate portion of said spring means being positioned underneath said retainer pin so that said spring means is retained on said body by said retainer pin;
a projecting portion extending from the body across said opening into contact with the base plate, said projecting portion having a guide toe extending out from said base plate at an acute angle to guide the bight of a flexible member between said spring means and the base plate and into said space; and
a portion between said projecting portion and said load bearing portion cooperating with the retainer finger of said spring supporting body to prevent lateral movement of said spring means transversely of said retainer finger.

3,889,322
MULTI-ELEMENT SELF-GRIPPING DEVICE
George C. Brumlik, Montclair, N.J., assignor to Ingrip Fasteners Inc., Montclair, N.J.
Continuation of Ser. No. 191,686, Oct. 22, 1971, abandoned. This application July 12, 1973, Ser. No. 378,489
Int. Cl. A44b *17/00*
U.S. Cl. 24—204 **9 Claims**



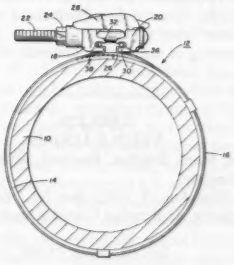
1. Self-gripping device comprising a plurality of upright gripping elements stiffly attached to a base, each of said gripping elements comprising an elongated member having at least one flat longitudinal edge section with at least one integral askewed wedge defined by a cut in the edge of said flat section with the portion of said flat section above the cut being rounded and bent out of plane from said flat section, said gripping elements being adapted to penetrate and become lodged in a receiving material.

3,889,323
END ATTACHMENT FOR WATCH BANDS
Kurt A. Reith, West Warwick, R.I., assignor to Textron Inc., Providence, R.I.
Filed Aug. 23, 1974, Ser. No. 500,045
Int. Cl.² A44C *5/18*
U.S. Cl. 24—265 B **16 Claims**



1. An end attachment for watch bands adapted to be mounted between spaced lugs of a wrist watch comprising,
an adaptor which comprises a generally tubular member adapted to receive a spring pin of a wrist watch, a plate-like member having one end integral with said generally tubular member, said plate-like member comprising a transverse generally rectangular opening substantially parallel to and adjacent to said generally tubular member, a clasp-supporting member having at least a portion thereof adapted to be positioned in engagement with at least a portion of said plate-like member,
means for securing said clasp-supporting member to a watch band,
clasp means, and
pivot means for connecting one end of said clasp means to a portion of said clasp-supporting member which is adjacent to said generally tubular member,
siad clasp means comprising a resilient flange, said resilient flange and the part of the clasp means which extends outwardly from said pivot means being passed through said generally rectangular opening to close and open the clasp means and, when the clasp means is in closed position, at least a portion of the upper surface of the clasp means being in engagement with at least a portion of the lower surface of said plate-like member and said resilient flange forming a snap fit with a portion of said clasp-supporting member, thereby detachably to secure the clasp-supporting member to the adaptor when the clasp means is in closed position.

3,889,324
BAND ATTACHMENT FOR PIPE REPAIR CLAMP
Charles J. Glover, Bradford, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed Oct. 12, 1973, Ser. No. 405,948
Int. Cl. B01j *6/00*
U.S. Cl. 24—279 **8 Claims**



1. In a pipe repair clamp, the combination comprising:
a. a flexible band adapted to generally encircle a pipe on which repair is to be made;
b. adjustable lug means for drawing said band into tight fitting installation engagement against the encircled pipe; and
c. anchor means for securing an end of said band to said lug means, said anchor means including bar means supported extending within a looped wrap of said band end and responsive to draw forces increasingly imposed on said band by installation adjustment of said lug means to effect a rotational interlock between said band and said lug means that operatively increases the gripping force therebetween in correlation to the draw forces increasingly imposed on said band.

3,889,325

PROCESS FOR SHRINKING NON-WOVEN WEBS

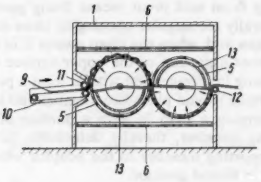
Heinz Fleissner, Egelsbach near Frankfurt am Main, Germany, assignor to VEPA AG, Switzerland

Continuation of Ser. No. 850,549, Aug. 5, 1969, abandoned. This application Jan. 24, 1973, Ser. No. 326,559

Claims priority, application Germany, Aug. 17, 1968, 1785165The portion of the term of this patent subsequent to Mar. 31, 1987, has been disclaimed.

Int. Cl. D06c *1/08, 27/00*

U.S. Cl. 26—18.5 10 Claims



1. A continuous process for the production of felts by shrinking a continuous random web of textile material which comprises overfeeding a web of textile material to a perforated surface of at least one sieve drum means subjected to a suction draft, conveying said web of textile material on said perforated surface, said web being retained on said perforated surface only by said suction draft, heating the textile material to a shrinking temperature by drawing a heated treatment medium through the web of material while the web is being conveyed on the perforated surface, the differential pressure across the web of material on said perforated surface being lower than about 40 mm. water column which is less than the shrinkage forces acting on said web of textile material whereby a uniform shrinkage of the web of material is obtained on said perforated surface, and further heating the web of shrunk textile material on a perforated surface of at least one other sieve drum means subjected to a suction draft to effect heat-setting of said textile material while said web is in a smoothed-out condition.

3,889,326

NEEDLE LOOMS

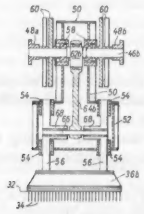
Trevor Tyas, Monk Bretton, England, assignor to Weldstow Limited, England

Filed Aug. 3, 1973, Ser. No. 385,249

Claims priority, application United Kingdom, Apr. 6, 1973, 16553/73

Int. Cl. D04h *18/00*

U.S. Cl. 28—4 R 11 Claims



1. For use in a needle loom, a needle board assembly comprising a needle board; a pair of drive rods spaced apart longitudinally of said needle board and attached to said needle board for movement therewith; first and second bearings for each of said drive rods, said first and second bearings of each said drive rod being spaced apart axially with respect to their associated drive rods, said first and second bearings constraining their respective drive rod to follow a rectilinear axial path; a rotary driving shaft; a connecting rod; a mechanism for producing reciprocation of said connecting rod from rotation of said driving shaft, and coupling means coupling said connecting rod to parts of said drive rods located between said first and second bearings.

3,889,327

METHOD FOR INTERLACING STRANDS OF A TEXTILE YARN

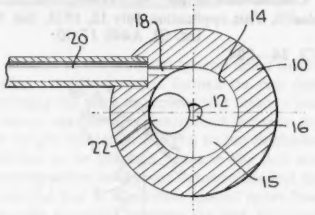
Jean Joly, Craponne, and Silvio Sangalli, Clauire, both of France, assignors to Rhone-Poulenc-Textile, Paris, France

Filed May 24, 1973, Ser. No. 363,561

Claims priority, application France, May 26, 1972, 72.19404

Int. Cl. D02g *1/16*

U.S. Cl. 28—72.12 11 Claims



1. A method for interlacing strands of a textile yarn, comprising the steps of:

advancing the yarn while under slight tension through an interlacing zone;

introducing at least one constant fluid current into the interlacing zone;

disturbing the constant fluid current randomly by impinging the fluid current on at least one movable object disposed in said interlacing zone to generate a fluctuating fluid current; and

impinging said fluctuating fluid current on the yarn to interlace the strands of the yarn.

3,889,328

PREPARATION OF COTTON YARNS FROM SLIVERS AND ROVINGS

Jan J. De Boer, Pijnacker, and Herman Borsten, Voorschoten, both of Netherlands, assignors to Nederlandse Organisatie Voor Toegepast-Natuurweten-Schappelijk Onderzoek Ten Behoeve Van Nijverheid, Handel En Verkeer, Netherlands

Division of Ser. No. 221,762, Jan. 28, 1972, Pat. No. 3,822,994. This application Nov. 21, 1973, Ser. No. 418,048

Claims priority, application United Kingdom, Feb. 19, 1971, 4982/71

Int. Cl. D06m *1/10*

U.S. Cl. 28—76 R 8 Claims

1. A process for preparing a cotton yarn with improved tensile strength retaining properties comprising:

a. selecting a material from the group consisting of cotton fibres, slivers, and rovings:

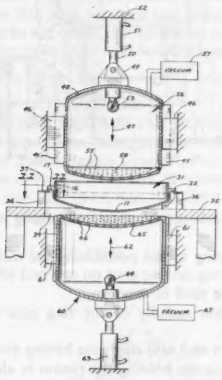
b. soaking the unrestrained material in a swelling agent to transform the material into Cellulose II;

c. stretching the material, in the presence of the swelling agent, to a length between 95% to 110% of the original length of the material before the soaking step, the stretched length being continuously maintained during the remaining steps of the process;

d. rinsing the material while in the stretched condition to remove the swelling agent;

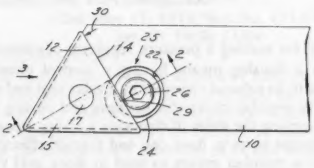
e. drying the material while in the stretched condition at a temperature in excess of 70°C in order to set the improved tensile strength properties obtained; and
f. spinning the material into a yarn.

3,889,329
PROCESS FOR MAKING COLOR TELEVISION MASKS
Fazal A. Fazlin, 902 W. County Rd., Apt. 116, New Brighton, Minn. 55110
Filed May 16, 1973, Ser. No. 360,643
Int. Cl. H01j 9/00
U.S. Cl. 29—25.14 **8 Claims**



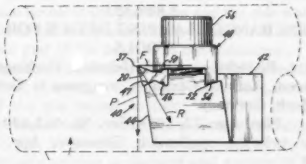
1. A method of manufacturing shadow-mask types of color cathode ray tubes having a face panel, and a shadow mask mounted adjacent said panel comprising the steps of:
forming a mask and support means assembly with said mask having an imperforate, curved surface; providing at least one surface of said mask in which apertures are to be formed with a coating of a sensitized resist; supporting said one surface of said mask adjacent a master exposing die formed to correspond to the desired curved shape of said mask, and exposing portions of the resist coating on said one surface of said mask while said one surface is supported; developing and etching said mask to create an aperture pattern in the exposed areas; and mounting said mask in a cathode ray tube face panel having means to provide repeatable positioning for any mask with respect to preselected portions of said cathode ray face panel.

3,889,330
LATERAL LOCK INDEXABLE INSERT CUTTING TOOL
Raymond Tibor Zweekly, Royal Oak, Mich., assignor to The Valeron Corporation, Detroit (Oak Park), Mich.
Filed June 19, 1974, Ser. No. 480,975
Int. Cl. B26d 1/00
U.S. Cl. 29—96 **8 Claims**



1. A cutting tool holder for supporting a removeable cutting insert having an aperture therethrough, said holder comprising;
a body member,
a fixed reaction surface for engaging a side wall of the insert,
a bottom seat surface for supporting the insert,
pin means extending from said bottom seat surface positioned to extend into the aperture in the insert,
insert locking means including a threaded hole in said body adjacent a side wall of said insert and spaced from said reaction surface, headed clamp screw means engaging said threaded hole, interengaging reaction surfaces in said body and screw acting in a plane normal to said adjacent side wall and adapted to laterally displace the head of said clamp screw in said plane and against said adjacent side wall upon rotative actuation of said clamp screw and thereby pivotally displace the insert against said fixed reaction surface to lock the insert in said holder, the principal three lines of force at said fixed reaction surface, pin, and screw head being substantially interspaced relative to each other to provide a leveraged side wall interaction about said pin as a fulcrum pivot.

3,889,331
MACHINE TOOL BIT AND HOLDER
Josef David Grungras, 726 Gerald Ct., Brooklyn, N.Y. 11235
Continuation-in-part of Ser. No. 311,429, Dec. 1, 1972, abandoned. This application Oct. 9, 1974, Ser. No. 513,455
Int. Cl. B26d 1/00
U.S. Cl. 29—96 **5 Claims**



1. A tool bit and tool bit holder combination, said tool bit comprising a longitudinally extending cutting section having a lower wall, a side wall and a top wall, said cutting section side wall and said cutting section top wall intersecting to form a longitudinally extending cutting edge, said tool bit further including a clamping section having a lower wall to side wall and a top wall, said cutting section and said clamping section being longitudinally cojoined thereby forming a longitudinally extending bow-tie shaped tool bit axis, a tool bit holder including a main holder body having longitudinally extending receiving means constructed and arranged for receiving said cutting section lower wall and being further constructed and arranged for receiving said clamping section lower wall and side wall, clamping means including receiving means constructed and arranged for receiving said clamping section top wall and means removably fixing said clamping means to said main holder body to removably fix said tool bit to said tool bit holder, said tool bit cutting section lower wall being generally normal with respect to said cutting edge.

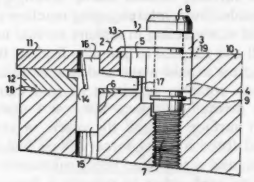
3,889,332
DEVICE FOR ATTACHING AN INSERT TO A TOOLHOLDER
Wlajko Mihic, Tegnervagen 9, 802 28 Gavle, Sweden
Filed Apr. 2, 1974, Ser. No. 457,323
Claims priority, application Sweden, Apr. 2, 1973, 7304579
Int. Cl. B26d 1/00
U.S. Cl. 29—96 **9 Claims**

1. A device for removably attaching an insert to a toolholder having a recessed portion with a shoulder for engage-

ment with said insert and a plurality of bores through its thickness, said device comprising:

a. a support member in said recess having one edge in alignment with the periphery of a first bore in said toolholder,

b. an insert on top of said support member, said insert having a hole therethrough in alignment with said first bore through the toolholder, one edge of said insert abutting said shoulder,



c. a first lever in said first bore through said toolholder engaging the inner surface of said hole through said insert, said first lever having an extension passing through said shoulder into a second bore through said toolholder,

d. a sleeve disposed in said second bore engaging said extension of said first lever,

e. a second lever engaging said insert and said sleeve, and

f. means to move said second lever toward said toolholder such movement exerting a force on said insert tending to hold it against said shoulder.

3,889,333

FAST EXCHANGE CLAMPING DEVICE FOR ROTARY TOOLS

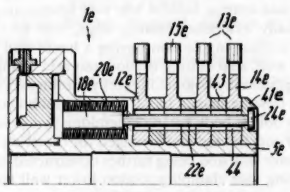
Otto Katz, Bildechingen, and Heinrich Tischinger, Unterer Augsbaum, both of Germany, assignors to Ledermann & Co., Horb, Germany

Filed Apr. 22, 1974, Ser. No. 462,640

Claims priority, application Germany, Apr. 25, 1973, 2320919

Int. Cl. B26d *1/12;* **B23c** *1/00;* **B27g** *13/00*

U.S. Cl. 29—104 **21 Claims**



1. In a quick exchange chucking device for rotary tools; a support means having a central axis and adapted for being driven in rotation on said axis, said support means having a surface perpendicular to said axis for engaging a tool, clamping means on said support means protruding axially through said surface and axially moveable on said support means, said clamping means having clamp surface means thereon facing said surface on said support means whereby a tool disposed between said surface on said support means and said clamp surface means on said clamping means can be clamped to said support means by axial movement of said clamping means on said support means, spring means in said support means biasing said clamping means in tool clamping direction, means for moving said clamping means in tool releasing position, and cooperating elements of a disengageable connection on said tool and said clamping means to permit removal of the tool when said clamping means are moved into tool releasing position.

3,889,334

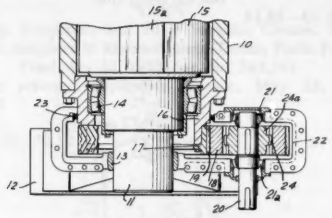
CONTROLLED DEFLECTION ROLL DRIVE

Edgar J. Justus, and Arnold J. Roerig, both of Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Filed Aug. 1, 1972, Ser. No. 277,110

Int. Cl. B60b *15/16*

U.S. Cl. 29—115 **11 Claims**



1. A driven roll construction comprising in combination,

a roll shell,

support bearing means positioning the roll for rotation,

an annular ring driving gear on one end of the roll shell for driving the shell in rotation,

a drive pinion radially of the ring gear in driving mesh therewith,

said pinion and said ring gear having drive aligning teeth therebetween holding the pinion in alignment with the ring gear,

a drive shaft,

and a flexible drive connected directly between the shaft and the pinion.

3,889,335

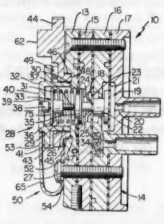
PRESSURE REGULATOR CONSTRUCTION AND METHOD OF MAKING THE SAME

Harold G. Brakebill; Jay L. Lewis, both of Concord, and Walter J. Berleyoung, Knoxville, all of Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 308,118, Nov. 20, 1972, Pat. No. 3,791,405. This application Nov. 29, 1973, Ser. No. 419,984

Int. Cl. B21d *53/00*

U.S. Cl. 29—157.1 R **11 Claims**



1. A method for making a pressure regulator construction provided with a housing means having a control chamber interconnected to an exhaust chamber by a valve seat and with a movable valve member means for opening and closing said valve seat comprising the steps of disposing a spring means in said housing means so as to have one end thereof effectively act on said valve member means to tend to move said valve member means in one direction relative to said valve seat, disposing a spring retainer to be movably carried by said housing means and have the other end of said spring means

effectively act against the same, disposing cam means to be movably carried by said housing means and be operatively associated with said spring retainer to adjust the same relative to said housing means and thus vary the force of said spring means whereby the set point of said regulator construction can be selectively set, securing said cam means and said spring retainer to said housing means with a mounting means that includes a single fastening member securing said spring retainer and said cam means to said housing means while permitting said movement therebetween, said spring retainer being axially movable along a longitudinal axis thereof relative to said housing means, said cam means being rotatable about said longitudinal axis, forming an annular flange means on said spring retainer, and forming cam surface means on said cam means so as to be disposed between said housing means and said flange means to act on said flange means to axially adjust said spring retainer relative to said housing means.

3,889,336

APPARATUS FOR ASSEMBLING COMPONENTS

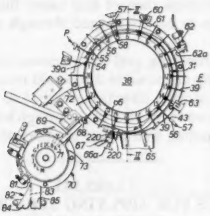
John Brown Buchanan, Crookham; Stanley William Stephens, Lightwater, and Julian Pascoe Grenfell, Pyrford, all of England, assignors to Badalex Limited, Weybridge, England

Filed Dec. 28, 1973, Ser. No. 429,159

Claims priority, application United Kingdom, Jan. 9, 1973, 1087/73

Int. Cl. H05k *13/00*

U.S. Cl. 29—203 P **25 Claims**



1. Apparatus for assembling a plurality of components on a common elongate element, the apparatus including turret means provided with a plurality of elongate guides for elongate elements, means to index the turret means to offer each guide sequentially to a plurality of stations, component feed means at a plurality of stations each operable to apply a component to a guide and component positioning means at at least one station operable to position a component relative to an element in a guide and thereby establish the components relative to the element and to the turret means.

3,889,337

LOCATOR FOR APPLICATORS ADAPTED TO APPLY ELECTRICAL CONNECTORS TO PRINTED CIRCUIT BOARDS

Mervin Leonard Shughart, Carlisle, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 17, 1974, Ser. No. 471,075

Int. Cl. H05k *13/04*

U.S. Cl. 29—203 B **12 Claims**

1. In combination with an applicator adapted to apply electrical connectors or the like to a printed circuit board, said connectors or the like having a portion which is adapted to extend through and beyond an aperture in said printed circuit board, the combination therewith of locator means adapted to locate an aperture in said printed circuit board with respect to said applicator; said locator means comprising:

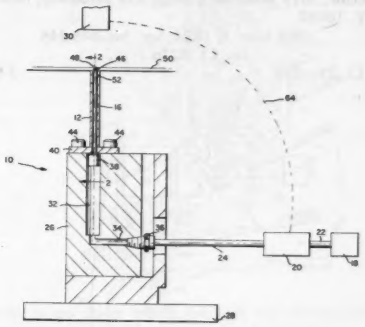
a support member provided with an elongated vertically extending aperture;

pin means slidable within said aperture between a lowered position and a raised locating position wherein an end portion of said pin means extends above said support member to facilitate locating an aperture in the printed circuit board relative to said applicator, there being clearance between said pin means and the side walls of the aperture to permit air to flow therebetween;

a source of compressed air; and

interconnecting means for interconnecting the source of compressed air with said aperture;

the parts being so arranged and constructed that the compressed air when interconnected with said aperture will



normally bias the pin means into its raised locating position, a portion of the compressed air flowing through the clearance between the pin means and the side walls of the aperture to blow any undesirable matter out of said aperture, one end of the portion of the connector or the like which is adapted to extend through and beyond the aperture in the printed circuit board contacting the end portion of the pin means to force it within the aperture against substantially constant pressure as the connector is applied, the side walls of the aperture in the support member also serving to support said portion of the connector or the like as it is applied.

3,889,338

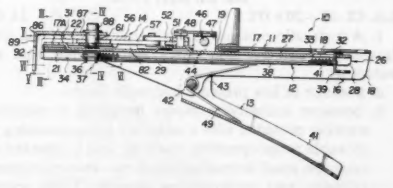
BINDER

Hideo Hosaka, Takasaki, Japan, assignor to Max Kabushiki Kaisha, Tokyo, Japan

Filed June 17, 1974, Ser. No. 479,606

Int. Cl. B23p *11/00*

U.S. Cl. 29—243.56 **10 Claims**



1. A binder for securing a substantially channel-shaped clip in surrounding relationship to an object, comprising:

a housing;

jaw means mounted on said housing and coacting with a clip for deforming same into a loop, said jaw means including a pair of jaw members pivotally mounted on said housing and swingably movable about a first axis between open and closed positions, each jaw member having a jaw portion associated therewith and positioned for engaging said clip for deforming same;

an operating handle pivotally mounted on said housing for swinging movement about a second axis which is substantially perpendicular to said first axis; and

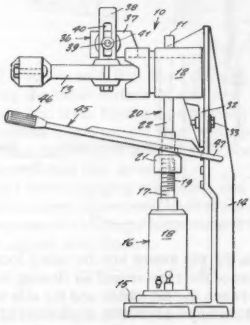
connecting means operatively coupled between said jaw members and said operating handle for causing swinging movement of said jaw members in response to swinging movement of said operating handle.

3,889,339

PRESS FOR HOME REMOVAL OF PISTON PINS

Johnny A. Pollock, and George Spector, both of c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Mar. 5, 1974, Ser. No. 448,346
Int. Cl. B23p *19/02*
U.S. Cl. 29—252 **3 Claims**



1. In a piston pin press, the combination of an upright frame, a platform at a lower end of said frame, a jack mounted upon said platform, said jack including a hydraulic cylinder from the upper end of which a vertically movable piston rod extends, and a press pin on an upper end of said rod serving to push a piston pin out of a head of a piston, wherein stationary lugs are at an upper end of said frame and an adjustable bracket having lugs is supported on said frame so to hold said piston between said stationery lugs and said lugs on said adjustable bracket.

3,889,340

HYDRAULIC PRESSURE INTENSIFIER SYSTEM

William Jennings Dixon, Jr., Charlotte, N.C., assignor to R. H. Bouligny, Inc., Charlotte, N.C.

Filed Feb. 21, 1974, Ser. No. 444,356
Int. Cl. B21f *15/00*
U.S. Cl. 29—203 DT **11 Claims**

1. A hydraulic pressure intensifier system for use with hydraulically operated tool means and the like, said system including:

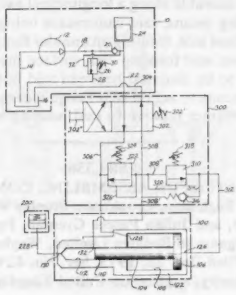
a. a source of low pressure hydraulic fluid;

b. pressure intensifying means including a reciprocating member provided with a relatively large operating piston movable in an operating chamber and connected with a relatively small intensifier piston movable in an intensifier cylinder, said reciprocating member being selectively movable by said low pressure source fluid from a starting position in a first direction to cause the pressure of the fluid in said intensifier cylinder to be intensified and being selectively movable in a second direction to return said reciprocating member to said starting position thereof, said intensifier cylinder having an inlet port located adjacent the leading end of said intensifier piston at said starting position thereof and an outlet spaced from said inlet port, said inlet port being closed by said intensifier piston as it moves across said inlet port during movement of said reciprocating member; and

c. a hydraulic circuit including conduit means connecting said source to said pressure intensifying means and including selectively operable control means for sequentially:

i. admitting said low pressure source fluid solely to said pressure intensifying means outlet for supplying said tool means;

ii. then admitting said low pressure source fluid to said pressure intensifying means operating chamber when



the fluid pressure at said outlet increases to a predetermined level to move said reciprocating member in said first direction thereof and cause fluid at an increased pressure to be discharged through said outlet to said tool;

iii. then admitting said low pressure source fluid to said operating chamber to move said reciprocating member in said second direction thereof to cause fluid to be withdrawn from said tool through said outlet; and

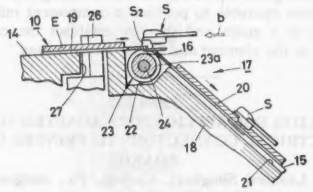
iv. then venting said outlet to atmospheric pressure.

3,889,341

APPARATUS FOR APPLYING SLIDERS TO A SLIDE FASTENER CHAIN

Ikuo Takamatsu, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 426,927, Dec. 20, 1973. This application Oct. 9, 1974, Ser. No. 513,321
Claims priority, application Japan, Dec. 27, 1972, 47-1526
Int. Cl. B23p *19/04*
U.S. Cl. 29—207.5 SL **2 Claims**



1. An apparatus for applying sliders to a slide fastener chain having a pair of opposed stringer tapes carrying rows of fastener elements along their respective inner longitudinal edges and provided with transverse slits formed across said longitudinal edges at spaced locations along the fastener chain, which apparatus comprises:

a. a guide block having a first or horizontal guide surface and a second guide surface extending at an angle downwardly inclined relative to said first guide surface, along with surfaces the fastener chain is transported intermittently and a guide groove extending longitudinally along

said first and second guide surfaces for receiving sliders slidably therein;

b. means for splitting open the transverse slits in the fastener chain so that the upper edge of each of said slits is aligned with an entrance end of a slider, said means being located at a point interconnecting the lines of extension of said first and second guide surfaces;

c. separating means vertically movable into and away from the path of the fastener chain along said first guide surface adjacent said splitting means for separating the two opposed stringer tapes prior to arrival of the fastener chain at said splitting means; and

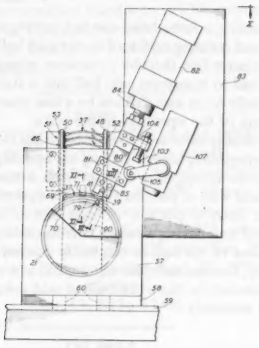
d. a slider holder movable towards and away from said splitting means and adapted to release sliders one at a time onto the fastener chain at a point slightly beyond said splitting means by threading the slider through said transverse slit.

3,889,342

APPARATUS FOR ASSEMBLING PISTON RING END GUIDES

Jack E. Mulligan, Ferguson, Mo., assignor to Ramsey Corporation, St. Louis, Mo.

Filed Sept. 12, 1973, Ser. No. 396,500
Int. Cl. B23q *7/10*
U.S. Cl. 29—211 D **16 Claims**



1. Apparatus for assembling end guides with split piston rings of channel shape, comprising:

means for mounting a split piston ring in position to receive an end guide in assembly therewith and including means for properly locating the gap between ends of the ring at the ring gap;

means for positioning an end guide adjacent to the ring across the gap and aligned with the ring channel; and

inserting means for thrusting the end guide laterally into the ring channel across the gap.

3,889,343

AUTOMATIC COLLET HINGE/SCREW PLACEMENT MACHINE

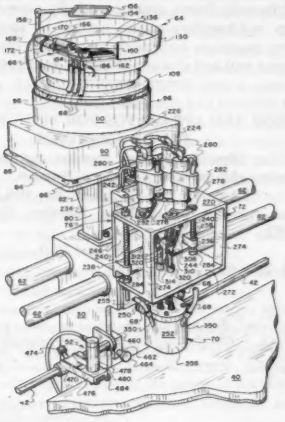
Leslie R. Miller, Phoenix, Ariz., and John D. McKenney, South Laguna, Calif., assignors to Royal Industries, Inc., Pasadena, Calif.

Filed Oct. 5, 1973, Ser. No. 403,747
Int. Cl.[2] B23Q *7/10*
U.S. Cl. 29—211 D **5 Claims**

5. In a hinge applicator machine, a head for simultaneously receiving, simultaneously holding and simultaneously inserting a plurality of screws through openings in a hinge into a door, said head comprising:

channels for delivering said plurality of screws to an equal number of insertion sites;

hollow means for receiving and holding each screw erect, including means for releasing each screw from the hollow means when each screw is set in the door;



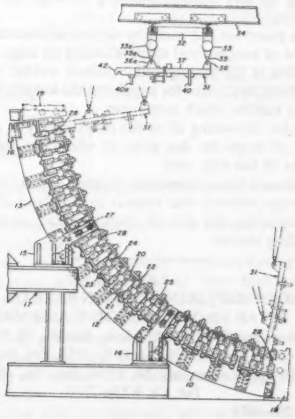
power screw driver means rotatably and reciprocably disposed within each hollow means to simultaneously engage, rotate and advance the held screws through openings in a hinge into the door.

3,889,344

EXTRACTOR FOR GUIDE ROLLS

Charles H. Bode, Jr., Bethel Park Borough; Carlton E. Craig, Mt. Pleasant Twp., Washington County; Donald L. Friend, McCandless Twp., Allegheny County; Louis G. Lazzaretti, Harmony Twp., Beaver County, and George J. Wagner, Jr., North Fayette Twp., Allegheny County, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 26, 1973, Ser. No. 428,566
Int. Cl. B23p *19/04*
U.S. Cl. 29—252 **15 Claims**



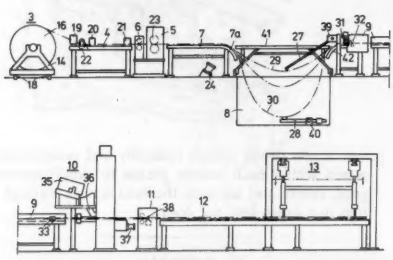
1. An extractor for removing or inserting the rolls of a continuous-casting machine, said extractor comprising a portable frame, means on said frame to be engaged for lifting and

positioning the frame with respect to the machine, means on one end of said frame for removably engaging fixed parts of the machine at any of a plurality of locations to afford a purchase of the frame on the machine at a location corresponding with any roll to be removed or inserted, an extensible and retractable carriage carried by said frame, motive means carried by said frame and operatively connected with said carriage, roll-handling means carried by said carriage, and operating means on said carriage for connecting the handling means to a roll and disconnecting it therefrom.

3,889,345
METHOD AND APPARATUS FOR MANUFACTURE OF FLOOR GRATINGS

Walter Ivar Hirschberg, Laxa, Sweden, assignor to Elektriska Svetsningsaktiebolaget, Goteborg, Sweden

Filed Oct. 15, 1973, Ser. No. 406,149
Claims priority, application Sweden, Oct. 16, 1972, 13308/72
Int. Cl. B23p *17/00*
U.S. Cl. 29—412 **5 Claims**



1. In the manufacture of floor gratings composed of longitudinal strips standing on edge with respect to the plane of the grating and crossbars welded to said longitudinal strips, the method of supplying the longitudinal strips to a welding station which comprises the steps of

advancing all of the strips jointly as a continuous mat of strips of the flat sides of which are parallel to the plane of the mat,

during said advancement gradually twisting each of the strips into on-edge position with respect to the plane of the mat, and,

feeding the mat of strips standing on edge into the welding station.

4. In a plant for the manufacture of welded floor gratings composed of longitudinal strips standing on edge with respect to the plane of the grating and crossbars welded to said longitudinal strips, apparatus for supplying the longitudinal strips to a welding station which comprises

means for advancing all of the strips jointly as a continuous mat of strips the flat sides of which are parallel to the plane of the mat, and,

guide means for progressively twisting each of the strips into on-edge position with respect to the plane of the mat and for directing the mat of strips standing on edge into the welding station.

3,889,346
METHOD OF REPAIRING A WORN BALL ON THE YOKE OF AN UNIVERSAL JOINT ASSEMBLY

Don A. Horwitz, 9024 Karlov Ave., Skokie, Ill. 60076

Division of Ser. No. 377,788, July 9, 1973, Pat. No. 3,841,178.
This application July 24, 1974, Ser. No. 491,234
Int. Cl. B23p *7/00*
U.S. Cl. 29—401 **3 Claims**

1. The method of repairing a worn ball of a ball coupling on a yoke of a universal joint assembly in which the ball is secured to and extends from an outer wall of the yoke opposed to a wall thereof from which a drive shaft extends, which method comprises:

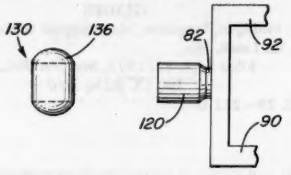
separating a cross element of the universal joint assembly from the yoke to expose a pair of opposed through openings in the yoke in corresponding opposed walls therof normal to the wall to which the drive shaft is secured, a line connecting centers of the openings defining an axis extending normal to a longitudinal axis of the drive shaft secured to the yoke,

providing a fixture including a base and a threaded shaft supported thereon to extend upwardly therefrom,

fastening the base of said fixture on the bed of a lathe so that said threaded shaft extends upwardly therefrom and normally thereto, said shaft being sized to pass through the pair of opposed openings in the yoke,

positioning said yoke on said fixture with said shaft projecting upwardly through said openings and with the worn ball on said yoke projecting toward a tool-carrying head of said lathe,

securing said yoke at a selectable height on said shaft to establish said worn ball on a live center line of said lathe,



presenting a lathe-head-carried cutting tool to said worn ball and rotating said tool to cut said ball annularly about said center line thereby to remove peripheral portions of said ball to transform said ball into a stub shaft extending normally to an axis defined by a line connecting the radial centers of the openings in the yoke,

axially sliding onto and fixedly securing to said stub shaft a superimposing sleeve having an opening contoured and sized for contiguous contact with a mating annular peripheral wall of said stub shaft, an outer bounding surface of at least a portion of said sleeve being spherically shaped and having a radius corresponding substantially to a radius of the ball as originally carried by said yoke,

whereby, functionally, the equivalent of a new ball has been substituted for the worn ball on said yoke of the universal joint assembly.

3,889,347
METHOD OF MAKING COMBUSTIBLE METAL FLASHLAMP CHARGES

Gerard J. Villani, Needham, and Ronald P. Fedora, Marlboro, both of Mass., assignors to Norton Company, Worcester, Mass.

Filed Aug. 7, 1972, Ser. No. 278,469
Int. Cl. B23p *17/04*
U.S. Cl. 29—417 **11 Claims**

1. Process for making combustible metal fuel charges, comprising the steps of,

distributing powders of a first metal selected from the group consisting of hafnium, yttrium, tungsten, uranium, vanadium lanthanum, cerium, scandium, tantalum, zirconium, niobium and titanium, in a matrix of a powder of a second material which can transmit cold work stresses to the first metal to elongate its powder components to fibers, the two materials being a homogeneous mixture containig the first metal as at least 20 volume per cent thereof,

forming said mixed first metal and second material into a workable compact,

consolidating the compact through cold work,

further cold working the compact into an elongated member through the application of compressive forces thereto to work the component powders of first metal therein into a porous bundle of primarily, mechanically interlocked fibers and carrying the cold working to a degree that first metal fibers with surface to volume ratio characteristic

less than a one mil diameter fiber and at least 5 to 1 longitudinal aspect ratio are formed,

the compact as a whole being similarly formed into an elongated member of at least 5 to 1 longitudinal aspect ratio,

removing the matrix phase of second material from the porous bundle,

passivating the resultant bundle to inhibit premature combustion of the fibers of the first metal,

and feeding the bundle to a charging plant for cutting to discrete charges.

3,889,348

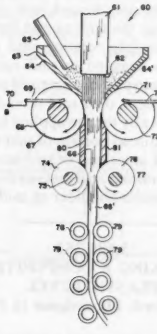
FIBER REINFORCED COMPOSITE MATERIAL AND METHOD OF MAKING SAME

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 814,885, March 27, 1969, Pat. No. 3,608,183, which is a continuation-in-part of Ser. No. 573,148, July 26, 1966, Pat. No. 3,437,783, which is a continuation-in-part of Ser. No. 239, 034, Nov. 20, 1962, Pat. No. 3,734,597. This application Sept. 27, 1971, Ser. No. 184,044

Int. Cl. B23p *17/00*

U.S. Cl. 29—419 R **13 Claims**



1. A method of forming a composite article comprising:

forming a composite mixture of elongated filmanets into a discrete matte formation of space-separated filaments defining a plurality of layers of filamentary material with the individual filaments generally aligned within each layer wherein said matte formation defines interstices between adjacent filaments,

disposing said matte formation in the cavity of a mold,

admitting a molding material in a moldable condition to said mold cavity and causing said molding material to completely fill the interstices between the filaments of said matte formation and said mold, and

forming a solid composite article by causing said molding material to form a solid mass in situ between the filaments of said matte formation so as to encapsulate said filaments within said solidified molding material.

9. A method of forming a composite material comprising:

continuously forming a first material into a plurality of filaments and feeding said filaments to a movable forming means,

flowing a second material to said movable forming means and causing said second material to surround the filaments being fed to said movable forming means,

solidifying said second material as it is operated on by said movable forming means to form a composite material composed of said filaments encapsulated within said second material.

13. A composite structure comprising: a matrix forming the major portion of said structure,

filamentary material disposed within said matrix as a plurality of layers of filaments having a matte-like configuration with the individual filaments generally aligned within each layer,

said matrix being selected from the group of metals including aluminum, magnesium, titanium, tungsten, and steel and alloys of such metals,

said filamentary material being selected from the group comprising boron, boron nitride, silicon nitride, silicon carbide, aluminum oxide, titanium carbide, tungsten carbide and pyrolitic graphite.

3,889,349

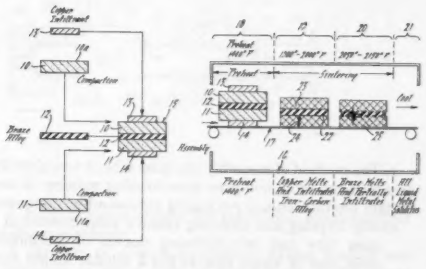
BRAZING METAL ALLOYS

Sydney M. Kaufman, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed June 8, 1973, Ser. No. 368,394

Int. Cl. B22f *3/16*

U.S. Cl. 228—173 **14 Claims**



1. A method of brazing porous ferruginous material, comprising:

a. compacting iron base powder to form a pair of mating article portions,

b. arranging an iron base powder infiltrant having a melting temperature substantially lower than high carbon-iron materials, said arrangement placing said infiltrant adjacent a surface of said article portions,

c. arranging a brazing material for interconnecting said mating portions, said brazing material having a weaker capillary attraction with said infiltrant than with said iron base powder,

d. subjecting said contiguously arranged article portions, brazing material and infiltrant to a stepped sintering operation whereby said infiltrant is first permitted to melt and migrate into said article portions in a controlled manner short of said brazing material, said brazing mate-

rial then melting to infiltrate said article portions only closely adjacent to said mating surfaces thereby providing a durable bond between said article portions on cooling to ambient conditions.

3,889,350

METHOD OF PRODUCING A FORGED ARTICLE FROM PREALLOYED WATER-ATOMIZED FERROUS ALLOY POWDER

Stanislaw Mocarski, Windsor, Canada, assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 129,146, March 29, 1971, abandoned. This application Oct. 9, 1973, Ser. No. 404,556
Int. Cl. B22f *3/24*
U.S. Cl. 29—420.5 **5 Claims**

1. A process for forging an article having high impact strength from a metal powder comprising

water atomizing a charge of molten ferrous alloy metal to a prealloyed iron metal powder consisting essentially of about 0.25 – 0.6 weight percent manganese, 0.2 – 1.0 weight percent nickel, and 0.2 – 0.8 weight percent molybdenum, said prealloyed powder containing minimal amounts of carbon and oxygen the balance being substantially iron,

mixing said powder with an effective amount of graphite to provide for desired hardenability, and

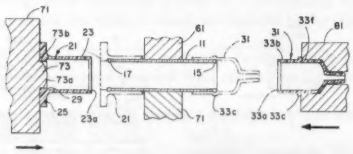
forging said powder and graphite mixture into the shape of the article.

3,889,351

METHOD OF ASSEMBLING A GLASS TUBE AND THERMOPLASTIC RESIN, FINGER GRIP AND NOSE SLEEVE SYRINGE BODY ASSEMBLY

Edward A. Tischlinger, Des Plaines, Ill., assignor to MPL, Inc., Chicago, Ill.

Continuation of Ser. No. 197,718, Nov. 11, 1971, abandoned. This application Mar. 18, 1974, Ser. No. 451,926
Int. Cl. B23p *11/02*
U.S. Cl. 29—447 **13 Claims**



1. The method of assembly of a glass tube, a non-glass finger grip member and a non-glass nose-forming member to form a unitary pharmaceutical packaging subassembly, comprising

axially aligning and effecting relative axial movement of a glass tube and two opposing sleeves of thermoplastic resin, one of which sleeves has a tubular sheath section and a laterally extending finger grip thereon, and the other of which sleeves is a nose-forming sleeve having a tubular sheath section and a reduced diameter dispensing section, each of said sleeves being disposed with its sheath extending toward a respective open end of said glass tube, and effecting axial motion of each of said sleeves toward and relative to said respective open ends and into coaxial engagement therewith to a point where said sleeve sheaths effectively encompass a substantial longitudinal wall extent at each respective end of said tube, and lie in intimate intersurface contiguity thereabove,

said thermoplastic resin sleeve sheath sections each having an internal relaxed diamter prior to assembly and when at normal room temperatures of approximately 70°F, of less diameter than the effective outer diameter of the respective end of said glass tube,

and camming said sleeve sheath sections to a larger stretch-fit and effective inner diameter through sequential incremental outward camming action on said sleeve sheaths at each successive incremental zone of axial interengagement between each of said sleeve sheath and the respective end of said glass tube,

said camming action at each end of said glass tube being effected by camming interaction between a sloped annular cam surface formed on one of the initially interfacing ends of said tube and said thermoplastic resin sleeve,

heating said sleeves prior to assembly with said glass tube, assembling said sleeves and glass tube while said sleeves are in an elevated temperature condition,

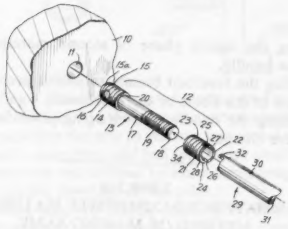
and enabling cooling of said sleeves in situ on said glass tube.

3,889,352

METHOD OF MOUNTING LOCKING, SELF-TAPPING THREADED STUD INSERT ASSEMBLY

Robert W. Bosse, Englewood Cliffs, N.J., assignor to Groov-Pin Corporation, Ridgefield, N.J.

Division of Ser. No. 336,872, Feb. 28, 1973. This application Oct. 17, 1974, Ser. No. 515,656
Int. Cl. B23p *11/00*
U.S. Cl. 29—432 **2 Claims**



1. The method of mounting a self-tapping threaded stud assembly in a cylindrical opening formed in a material relatively softer than the material of said stud, said stud including an enlarged cylindrical inner end including a tapping thread and a reduced diameter shank including a holding thread, said enlarged and reduced portions being separated by an annular shoulder, and a tubular locking sleeve having an internal bore slidable over said reduced diameter portion of said stud, the external circumference of said sleeve being threaded to match the threading of said tapping thread, said sleeve, in addition, including drive means at the trailing end thereof, which comprises the steps of forcibly rotating said shank while said threaded inner end is engaged in said opening, thereby to thread said inner end into said opening and tap a thread in said opening, sliding said sleeve over said threaded-in stud, thereafter rotating said sleeve by torque applied to said drive means to cause said external thread portion of said sleeve to enter the threads tapped by said inner end of said stud, and continuing to rotate said sleeve until the lead end portion thereof engages tightly against said annular shoulder of said stud.

3,889,353

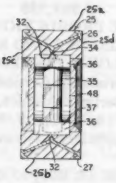
METHOD OF MAKING A COMPOSITE METAL AND PLASTIC LEVEL

Mike A. Provi, Rockford, Ill., assignor to Pro Products, Inc., Rockford, Ill.

Continuation-in-part of Ser. No. 363,978, May 25, 1973, abandoned. This application May 31, 1974, Ser. No. 474,936
Int. Cl. B23p *3/00, 25/00*
U.S. Cl. 29—458 **15 Claims**

1. A method of making a spirit level having an elongated level body of generally rectangular cross section with a pair of relatively parallel edge faces and a pair of relatively parallel side faces comprising: forming an elongated metal frame having four relatively parallel rails arranged in a transversely

rectangular array to extend along the four lengthwise extending corners of the level body and internal web portions rigidly interconnecting the rail portions and spaced inwardly of the rectangular array to define a longitudinal channel at each of the four sides of the array, providing a first pair of mold members having opposed edge face forming surfaces and relatively moving the first pair of mold members in a direction laterally of one pair of relatively parallel sides of the array until the edge face forming surfaces are firmly pressed against the rails at said one pair of relatively parallel sides of the rectangular array and close the outer side of channels thereat, providing a second pair of mold members having opposed side face forming surfaces and relatively moving said second pair of



mold members in a direction laterally of the other pair of relatively parallel sides of the rectangular array until the side face forming surfaces are firmly pressed against the rails at said other pair of relatively parallel sides of the rectangular array and close the outer sides of channels thereat and form a mold cavity around the frame, introducing a flowable plastic material into the channels of the type hardenable to form a rigid plastic body, allowing the plastic material to harden in the channels to form a rigid plastic body on the metal frame, and separating the mold members from the composite metal frame and rigid plastic body to provide an elongated level body with the outer faces of the four rails exposed at its four lengthwise corners to provide accurate level surfaces, and mounting level vials on said level body.

3,889,354
METHOD OF FORMING A CRIMPED TUBE JOINT

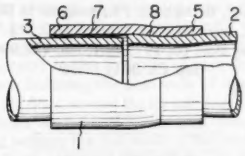
Sunao Nishi; Shojiro Ikeda, both of Nagasaki, and Asao Kawazoe, Tokyo, all of Japan, assignors to Shinto Kogyo Kabushiki Kaisha, Nagasaki, Japan

Continuation of Ser. No. 142,803, May 12, 1971, abandoned, which is a continuation of Ser. No. 809,653, March 24, 1969, abandoned. This application Feb. 8, 1974, Ser. No. 440,747

Claims priority, application Japan, Mar. 29, 1968, 43-20080

Int. Cl. B21d *39/00;* **B23p** *11/00*

U.S. Cl. 29—516 **2 Claims**



1. A method of forming a leak-proof joint between end parts of first and second pipes by means of a sleeve having opposite ends in which said first and second pipes and sleeve have both elasticity and plasticity, with the inner diameter of the sleeve being approximately equal to the outer diameter of the first and second pipes, comprising the steps of inserting the end part of the first pipe into one end of the sleeve, inserting the end part of the second pipe into the other end of the sleeve, placing a portion of each of the overlapped end parts of the first and second pipes and sleeve between opposed semicircular concave faces of two diametrically opposed jaw members and having the same radius, the length of the faces being equal to a compressing distance of the overlapped parts extending from the end edge of the sleeve but short of the telescoped pipe end, the radius being equal to the desired outer radius of each overlapped portion of the sleeve after crimping, and then applying a crimping force to both jaw members from diametrically opposite sides in a direction perpendicular to the axial direction of the pipes to plastically deform the sleeve and pipe inwardly at each overlapped portion respectively, said inwardly deformed portion extending from the end edge of the sleeve to a location short of the telescoped pipe end, thereby causing uniform contact pressure between the surfaces thus contacted.

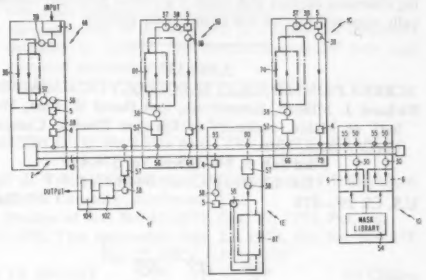
3,889,355
CONTINUOUS PROCESSING SYSTEM

Jesse Aronstein, and William E. Harding, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 5, 1973, Ser. No. 329,920

Int. Cl. B01j *17/00*

U.S. Cl. 29—569 **10 Claims**



1. A manufacturing system for processing semiconductor substrates comprising:

A. a plurality of processing stations having loading and unloading positions, each of said stations having means for performing a plurality of different fixed semiconductor device fabricating operations on a said substrate, wherein

a. one of said operations in at least one of said stations includes means for application of a coating of photoresist on a surface of individual ones of said substrates;

B. a conveyor means for detachably supporting and transporting individual ones of said substrates between and at any one of said work stations;

C. means for detaching individual ones of said substrates from said conveyor means and transferring said individual ones of said substrates between said conveyor and said stations at their said loading and unloading positions; and

D. control means for said conveyor and transfer means for routing said substrates individually between any prescribed sequence of said stations for a corresponding prescribed series of processing operations.

3,889,356

METHOD OF SUPPORTING DISTRIBUTOR BLANK FOR MACHINING

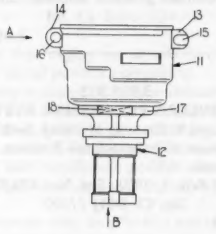
Brian William Cleaver, Walsall, and Alfred Rees, Birmingham, both of England, assignors to Joseph Lucas (Electrical) Limited, Birmingham, England

Division of Ser. No. 323,386, Jan. 15, 1973. This application July 5, 1974, Ser. No. 485,892

Claims priority, application United Kingdom, Jan. 15, 1972, 2043/72

Int. Cl. B23q 7/00

U.S. Cl. 29—559 2 Claims



1. A method of manufacturing an ignition distributor including starting with a casing blank having a hollow cup shaped body portion and an integral hollow shank portion, and supporting the blank for a machining operation by engaging clamping devices with each of a pair of generally diametrically opposed lugs on the casing body portion.

3,889,357

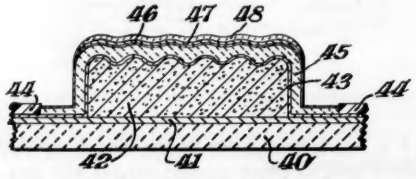
SCREEN PRINTED SOLID ELECTROLYTIC CAPACITOR

Richard J. Millard, Kennebunk, and David R. Poat, Wells, both of Maine, assignors to Sprague Electric Company, North Adams, Mass.

Filed July 5, 1973, Ser. No. 376,499

Int. Cl. H01g 13/00; B44d 1/18

U.S. Cl. 29—570 7 Claims



1. A method for manufacturing a solid electrolytic capacitor having a high volt-microfarad product per unit volume comprising:

a. preparing a mixture comprising finely divided valve metal powder, and a binder to achieve an ink exhibiting essentially no flow in horizontal thick film form under conditions of zero agitation;

b. screen printing successive layers forming a composite layer of said mixture on a substrate so that said composite layer has a rough outer surface reflecting the pattern of said screen, said substrate having at least one face made of said valve metal and said valve metal face comprising the anode connective means for said capacitor;

c. heating to solidify each said screened layer after each said screening step;

d. sintering said screened composite layer at a temperature between 1550°C and 2000°C, thereby transforming said composite layer into a porous valve metal pad being sinter bonded to said valve metal face;

e. forming by an electrolytic process, a valve metal oxide film over all exposed regions of said valve metal face and said porous valve metal pad;

f. dipping said substrate and said valve metal pad into an aqueous solution of manganous salt;

g. removing said substrate from said salt solution;

h. heating said pad and said salt solution adhering thereto to cause said salt to permeate said porous pad and to transform said salt into manganese dioxide by pyrolysis;

i. applying a conductive counterelectrode over said composite layer to form a cathode connection.

3,889,358

PROCESS FOR THE PRODUCTION OF HIGH VALUE OHMIC LOAD RESISTORS AND MOS TRANSISTORS HAVING A LOW STARTING VOLTAGE

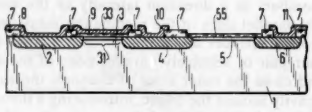
Hartwig Bierhenke, Zorneding, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 14, 1973, Ser. No. 397,402

Claims priority, application Germany, Sept. 26, 1972, 2247183

Int. Cl. B01j 17/00

U.S. Cl. 29—571 7 Claims



1. A process for the production of circuits having at least one field effect transistor with a source, a drain, and a gate, and having a resistor, on a common substrate, which process begins with a substrate body having at least one field effect transistor with source, drain and connection zones formed by diffusion, comprising the steps of: implanting ions adjacent the field effect transistor to produce a resistor, and simultaneously implanting ions in the channel zone of the field effect transistor to decrease the starting voltage of the field effect transistor and form an enhancement type field effect transistor, the simultaneous ion implantation comprising an ion implantation of a predetermined ion type with a predetermined ion energy and within a predetermined ion dosage range, the resistor possessing a value which is high in comparison to the forward resistance of the conductive field effect transistor and low in comparison to the reverse resistance of the field effect transistor.

3,889,359

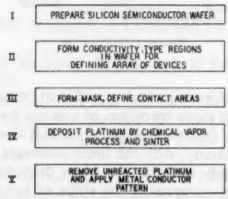
OHMIC CONTACTS TO SILICON

Myron Joel Rand, Bethlehem, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 10, 1973, Ser. No. 422,996

Int. Cl. B01j 17/00

U.S. Cl. 29—578 5 Claims


I
PREPARE SILICON SEMICONDUCTOR WAFER
II
FORM CONDUCTIVITY-TYPE REGIONS IN WAFER FOR DEFINING ARRAY OF DEVICES
III
FORM MASK, DEFINE CONTACT AREAS
IV
DEPOSIT PLATINUM BY CHEMICAL VAPOR PROCESS AND SINTER
V
REMOVE UNREACTED PLATINUM AND APPLY METAL CONDUCTOR PATTERN

1. In the fabrication of a silicon semiconductor device which includes the step of introducing into a portion of a p-

type conductivity silicon semiconductor body an n-type impurity to convert the conductivity type of said portion to an n-type conductivity zone, the further steps of forming a silicon oxide mask on the surface of said portion to define a contact area thereto and proceeding directly as a next step to deposit on said masked surface portion by the process of chemical vapor deposition a thin layer of platinum, said process comprising exposing said masked surface portion to a gaseous ambient containing a vapor of a phosphorous compound of platinum while said semiconductor body is at a temperature of between 100° and 500° C., followed by heating said body at a temperature of from about 675° C. to 750° C. for a period of from 5 to 10 minutes.

3,889,360

METHOD FOR FABRICATING A CHOKE WITH ADJUSTABLE AIR GAP AND CHOKE PRODUCED THEREBY

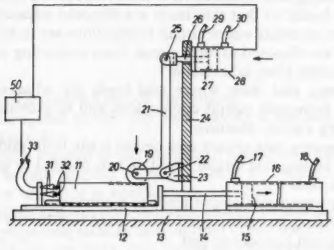
Ernst Meili, Uster, Switzerland, assignor to F. Knobel Elektro-Apparatebau AG, Ennenda, Switzerland

Filed June 8, 1973, Ser. No. 368,123

Claims priority, application Switzerland, June 9, 1972, 8668/72; Jan. 18, 1973, 698/73

Int. Cl. G01r *27/16*

U.S. Cl. 29—593 **6 Claims**



1. A method for fabricating a ballast wherein the air gap provided with an insert can be adjusted by core portions displaceable with respect to one another, the improvement comprising the steps of: clamping the relatively displaceable core portions between a floor provided with upstanding side edges and a resilient hood having side walls and which hood can be displaceable in the direction of such floor, adjusting a desired air gap, fastening the side walls of the hood with the side edges of the floor, so that the air gap insert is continuously maintained under a substantially constant stress, the fastening step including welding the side walls of the hood with the side edges of the floor, inserting the ballast into a tuning device after adjustment of the air gap and welding of the side walls of the hood with the side edges of the floor, applying a roller of the tuning device so as to act upon the ballast with adjustable pressure, effecting relative displacement between the roller and the ballast in the lengthwise direction of the ballast, to thereby continuously squeeze together the insert by the rolling motion of the roller at the ballast, and controlling the pressure at the roller by an impedance measuring device connected with the ballast such that upon attaining a rated impedance the pressure acting at the roller is diminished and thereby obtaining an exact fine tuning of the ballast.

3,889,361

SHORT WAVELENGTH WAVEGUIDES

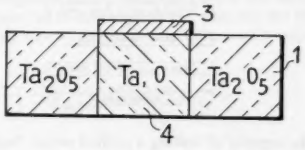
Michel Croset, and Gonzalo Velasco, both of Paris, France, assignors to Thomson-CSF, Paris, France

Division of Ser. No. 279,360, Aug. 10, 1972, Pat. No. 3,820,871. This application Feb. 28, 1974, Ser. No. 447,054

Claims priority, application France, Sept. 16, 1971, 71.33390

Int. Cl. H01p *11/00*

U.S. Cl. 29—600 **3 Claims**



1. A method of manufacturing a waveguide for supra high frequency comprising the following steps:

a. the production under vacuo of a stream of particles of a metal, in the presence of particles of a second body, said gaseous element being insufficient in quantity to produce a predetermined chemical, combination, and the deposition of the resultant compound upon a substrate, in order to obtain a thin film of a complex compound;

b. the deposition upon the free face of said film of a protective mask following a predetermined pattern;

c. the subjecting of the assembly to a chemical treatment designed to convert the unmasked portions into said chemical combination.

3,889,362

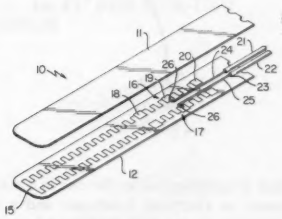
METHOD OF MAKING ELECTRICAL RESISTANCE ELEMENT

Hugh J. Tyler, Santa Ana, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 410,539, Oct. 29, 1973, Pat. No. 3,852,570. This application Sept. 25, 1974, Ser. No. 509,075

Int. Cl. H01c *1/14, 17/00*

U.S. Cl. 29—619 **10 Claims**

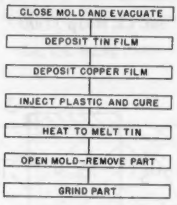


1. A method of making an electrical element comprising the steps of providing a conductor having a pair of lead attaching ends, forming each lead attaching end with a plurality of spaced and predetermined lead attaching parts therealong, attaching a pair of leads respectively to one preselected lead attaching part of each end of said conductor so that a desired electrical resistance is provided through said conductor between said leads, and completely covering said conductor and part of said leads with an encasing structure whereby the remainder of said leads extend from said encasing structure.

3,889,363
METHOD OF MAKING PRINTED CIRCUIT BOARDS

Richard P. Davis, Sanbornton, N.H. 03269

Continuation of Ser. No. 115,408, Feb. 16, 1971, abandoned. This application Jan. 10, 1973, Ser. No. 322,463
Int. Cl. H05k *3/02*
U.S. Cl. 29—625 9 Claims



1. The method of making a printed circuit board in a mold having a cavity with oppositely disposed first and second walls which comprises; forming a first layer of solder-like material of low melting point on said first wall; forming a second layer of conductive material, of a type adapted to make a completed printed type circuit, on said first layer said layers being formed in a desired circuit pattern limited to selected portions of said first wall; forming paths of said type of conductive material extending from said first wall to said second wall and connected to said pattern; molding insulating material in said cavity to form a board bonded to said circuit pattern and including said paths; and melting said layer of solder-like material to simultaneously release the board from the mold and bond with and thereby tin said conductive material.

3,889,364
METHOD OF MAKING SOLDERED ELECTRICAL CONNECTIONS

Ekkehard Krueger, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed June 4, 1973, Ser. No. 366,518
Claims priority, application Germany, June 2, 1972, 2226958
Int. Cl. H01r *43/02*
U.S. Cl. 29—628 14 Claims

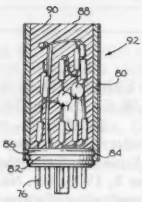
1. A method of metering solder for use in a soldered connection between an electrical conductor and a conductive element, comprising the steps of: forming a loop of capillary size in said conductor, exposing said loop to a bath of molten solder, withdrawing said loop from said bath and permitting the solder acquired by said loop to solidify, whereby a predetermined amount of solder is acquired by said loop by capillary action, said solder solidifying into a membrane closing said loop.

9. A method of making a soldered connection between an electrical conductor and a conductive element, comprising the steps of; forming a loop of capillary size in said conductor, exposing said loop to a bath of molten solder, whereby a predetermined amount of solder is acquired by said loop by capillary action and solidified into a membrane closing said loop, juxtaposing said loop with said conductive element, and applying heat to said membrane to melt said solder and allow said solder to form said connection.

3,889,365
ELECTRONIC MODULE AND METHOD OF FABRICATING SAME

Gordon L. Brock, 7652 Garfield Ave., Space No. 28, Huntington Beach, Calif. 92648

Division of Ser. No. 170,200, Aug. 9, 1971, abandoned. This application Aug. 15, 1973, Ser. No. 388,444
Int. Cl. H05k *3/32*
U.S. Cl. 29—627 4 Claims



1. a method of packaging an electronic circuit having a plurality of electronic components comprising:

a. fabricating a reuseable board with a plurality of means for receiving and restraining said components in a predetermined relative disposition;

b. cutting and bending the leads of said components and disposing said components in their respective positions on said board so that said leads are disposed adjacent each other at points where circuit connections are to be made, and are disposed to form circuit leads projecting in a first direction from said circuit;

c. joining said leads where said leads are adjacent each other to form said circuit connections and to provide a self supporting circuit structure;

d. removing said circuit and circuit leads from said board and coiling said circuit about an axis parallel to said first direction;

e. connecting said circuit leads to a connector;

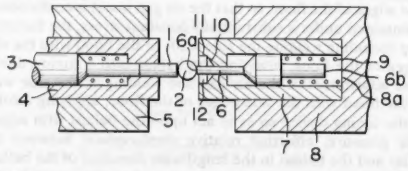
f. providing an open-ended cover over said circuit mating with said connector; and

g. potting said circuit by pouring a potting compound into said open-ended cover.

3,889,366
METHOD FOR PRODUCING ELECTRIC CONTACTS MADE OF INTERNALLY OXIDIZED SILVER ALLOY

Akira Shibata, Yokohama, Japan, assignor to Chugai Denkikogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 27, 1973, Ser. No. 419,277
Claims priority, application Japan, Nov. 28, 1972, 47-119216
Int. Cl. H01r *9/00*
U.S. Cl. 29—630 C 1 Claim



1. A method of producing electric contacts, which comprises the steps of

a. forming intermediate pieces of generally spherical shape and of constant diameter from a silver alloy containing

solute-metal, in which alloy the concentration of solute-metal is constant throughout;

b. applying internal oxidation process to said generally spherical pieces whereby to precipitate throughout said pieces an oxide of said solute-metal of constant solute-metal oxide content;

c. cleaning the surfaces of the pieces obtained according to step *b*; and

d. bonding the cleaned pieces to pieces of base metal by cold welding whereby to form composite electric contacts.

3,889,367

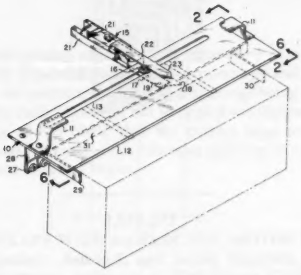
CARTON OPENER

Fred M. Walker, 407 E. Hathaway, San Antonio, Tex. 73209

Filed Mar. 1, 1974, Ser. No. 447,297

Int. Cl. B67b *7/30*

U.S. Cl. 30—2 **10 Claims**



1. A carton opening device comprising:

a. an elongated carton top plate having a top side and a bottom side,

b. a handle secured to the top side of said carton top plate, said handle adapted to be hand-held and stabilizes said carton top plate in contact with a surface,

c. a carton side support securely affixed to said top plate and projecting substantially normal to the bottom side of said carton top plate, said carton side support adapted to contact the side of a carton,

d. an elongated guide slot formed in said carton top plate and projecting substantially the length of said carton top plate,

e. attaching means slidably secured in said elongated guide slot,

f. a blade arm flexibly secured to said attaching means,

g. a blade means including a cutting edge secured to said blade arm, and

h. a blade oscillating slot constructed in said blade arm at said blade arm's point of engagement of said attaching means, said oscillating slot extending in a plane parallel to the cutting edge of said blade permitting oscillation of said blade in a reciprocal action.

3,889,368

KNIFE FOR CUTTING IN SLIDING CONTACT WITH RULER EDGE

Shohachi Kimeno, Tokyo, Japan, assignor to Conde Kabushiki Kaisha, Tokyo, Japan

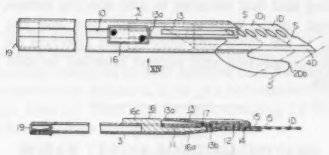
Filed Dec. 3, 1973, Ser. No. 421,486

Claims priority, application Japan, June 26, 1973, 48-75863

Int. Cl. B26b *1/08*

U.S. Cl. 30—162 **4 Claims**

1. A knife comprising in combination: a hollow blade holder of tubular form provided with a longitudinal slit therealong; an elongated knife blade slidably mounted in said blade holder and having a longitudinal cutting edge with a forward tip part and a sliding flank face provided near said tip part for sliding along a ruler edge thereby to enable the tip part to advance in a controlled path in cutting a material lying under the ruler edge, said knife blade being of a break-off type and having longitudinally equally spaced grooves disposed at a specific angle relative to the cutting edge of the blade and dividing the blade into a plurality of successively disposable blade units, said knife blade being provided with engagement holes disposed at intervals along the length of the blade; a guide member rigidly secured to said blade holder at a position spaced apart from and in front of said tip part in said path of cutting advance; a manually operable slider engaging in said slit in the blade holder for guided sliding movement along the slit, said slider being connected to said knife blade, whereby the blade can be adjustably moved longitudinally by manually moving



the slider; and knife bladle locking means for preventing said blade from moving longitudinally relative to said blade holder, said locking means comprising a tongue-like member extending from said blade holder longitudinally and forwardly and having an elastically deflectable property, a locking projection on the forward end of said tongue-like member for disengageably engaging any one of said engagement holes, a lever member integrally connected to said forward end of the tongue-like member and extending rearwardly along the same, and a projection on said lever member midway between the ends thereof and engaging with said blade holder to function as a fulcrum for said lever member, whereby when the free end of the lever member is manually depressed, the forward end of the tongue-like member is raised to disengage said locking projection from the hole with which it has been in engagement, thus allowing longitudinal movement of the knife blade.

3,889,369

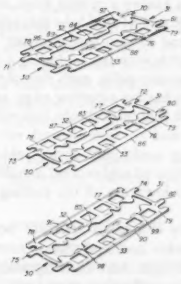
SHAVING UNIT FOR SAFETY RAZOR

Frank A. Ferraro, Trumbull, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 13, 1974, Ser. No. 532,429

Int. Cl.[2] B26B *21/54, 21/22*

U.S. Cl. 30—346.58 **10 Claims**

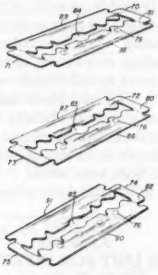


1. A shaving unit for a double edge safety razor, said shaving unit comprising:

a. a first flexible member including a pair of transversely extending opposite sides, each one of the first member opposite sides having a cutting edge;

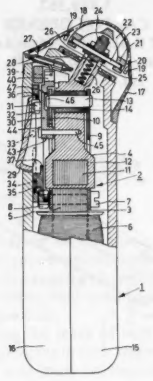
b. a second flexible member including a pair of transversely extending opposite sides, each one of the second member opposite sides having a cutting edge, said second member being located above said first member with the cutting edges of said second member being positioned upwardly and inwardly of the cutting edges of said first member;
c. flexible means between said first member and said second member for spacing said second member from said first member;
d. a transversely elongated aperture extending through said first member, said spacing means and said second member between the cutting edges of said first member and said second member for locating said shaving unit in said safety razor;
e. first means between said aperture and the cutting edges to one side only of said aperture for permanently connecting said first member to said spacing means; and
f. second means between said aperture and the cutting edges to the other side only of said aperture for permanently connecting said second member to said spacing means.

3,889,370
SHAVING UNIT FOR SAFETY RAZOR
George W. Hale, III, Plymouth, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Dec. 13, 1974, Ser. No. 532,428
Int. Cl.[2] B26B *21/54, 21/22*
U.S. Cl. 30—346.58 **15 Claims**



1. A shaving unit for a double edge safety razor, said shaving unit comprising:
a. a first flexible member including a pair of transversely extending opposite sides, each one of the first member opposite sides having a cutting edge, and a pair of spaced end tabs, each one of said tabs extending outwardly from an opposite end of said first member;
b. a second flexible member including a pair of transversely extending opposite sides, each one of the second member opposite sides having a cutting edge, and a pair of spaced end tabs, each one of said tabs extending outwardly from an opposite end of said second member, said second member being positioned above said first member with the cutting edges of said second member being positioned upwardly and inwardly of the cutting edges of said first member;
c. a transversely elongated aperture between said tabs of said first member and said second member and vertically extending through said shaving unit for locating said shaving unit in said safety razor; and
d. means between said aperture and the cutting edges to one side only of said aperture for permanently connecting said first member and said second member together;
e. the cutting edges to said one side of said aperture being spaced apart a predetermined distance, and the cutting edges to the other side of said aperture being spaced apart a distance less than said predetermined distance when said first and second members are in an unflexed state.

3,889,371
ELECTRIC DRY SHAVER
Jan de Boer, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Nov. 29, 1973, Ser. No. 420,114
Claims priority, application Netherlands, Dec. 22, 1972, 7217485
Int. Cl. B26b *19/10*
U.S. Cl. 30—34.1 **8 Claims**

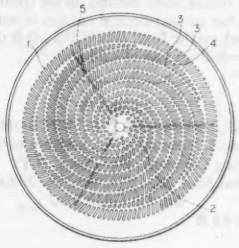


1. In an electric dry-shaver including in a housing a motor with a reciprocally movable armature and a reciprocal cutter of a long hair clipper, the improvement in combination therewith of coupling means for driving said cutter, comprising a drive lever having a lower end pivotally engaged to said armature, an upper end pivotally engaged to said cutter, and intermediate said ends first pivot means, an actuating member mounted on said housing and movable between a first operative position and a second in-operative position, this member having a second pivot means generally adjacent said first pivot means of said drive lever, said actuating member, when moved to its first position having its second pivot means engaged to said first pivot means in a pivot connection, said drive lever with its lower end driven reciprocally by said armature, pivots about said pivot connection and has its upper end and said engaged cutter being reciprocally driven, and said actuating member when moved to its second position rendering said first and second pivot means dis-engaged and said cutter in operative, with said drive lever having its lower end reciprocally driven while its upper end becomes a pivot point.

3,889,372
ELECTRIC DRY SHAVER BLADE ASSEMBLY
Satoshi Sakai, Hirakata; Norio Shimizu, Neyagawa, and Junji Nomura, Takatsuki, all of Japan, assignors to Matsushita Electric Works, Ltd., Japan
Filed Aug. 30, 1973, Ser. No. 393,177
Claims priority, application Japan, Aug. 30, 1972, 47-86949; Nov. 9, 1972, 47-129080
Int. Cl. B26b *19/14, 21/54*
U.S. Cl. 30—43.6 **5 Claims**

1. A cutting blade assembly for an electric dry shaver including a circular stationary blade in the form of a metallic membrane having an apertured field and a rotating blade having a generally radially oriented cutting edge rotating concentrically against the stationary blade, the stationary blade having a pattern of smoothly continuous spaced ribs each lying in an arcuate locus, the ribs being interfittingly

spiralled and uniformly spaced from one another in generally parallel relation, adjacent ribs having formed between them a plurality of elongated hair inlet openings spaced adjacent to one another in generally parallel relation with the longitudinal dimension of each opening spanning the space between adjacent ribs, the openings being spaced closely to one another



with a latteral spacing which is of the same order of magnitude as the width dimensions of both the openings and the ribs throughout the pattern, the hair inlet openings being oriented in a generally radial direction but so angled with respect to the cutting edge of the blade that the cutting edge progresses along the length of each of the hair inlet openings at a substantially constant shearing angle.

3,889,373

GRASS SHEARS WITH AN ELECTRIC MOTOR DRIVE

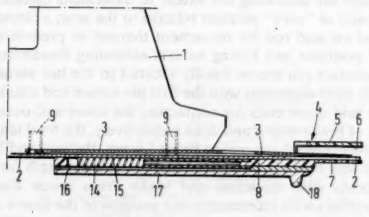
Dieter Achenbach, Betzdorf, and Joswig Siegfried, Kausen, both of Germany, assignors to Wolf-Gerate GmbH, Germany

Filed Mar. 1, 1974, Ser. No. 447,274

Claims priority, application Germany, Apr. 16, 1973, 2319219

Int. Cl. B26b *19/38*

U.S. Cl. 30—233 **12 Claims**



1. A motorized grass shears with two generally flat, overlaid blades; each said blade having a plurality of teeth extending in the same first direction; means for moving one said blade with respect to the other said blade in a manner such that neighboring said teeth, one on each said blade, cooperate to cut and wherein a blade gap is defined as a first distance in from the free ends of said teeth, wherein neighboring said teeth are spaced apart;

blade protective means extending across said blade gap and comprising an upper cover plate above the upper said blade and a lower cover plate beneath the lower said blade;

means for guiding said protective means from a first position covering said blade gap, along a path away from said free ends of said teeth to a second position exposing said blade gap; biasing means for biasing said protective means to its said first position; said cover plates being shaped to be unbroken and in said first position they completely cover said blade gap.

3,889,374

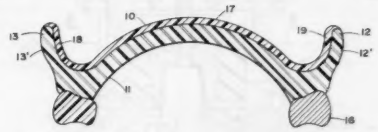
DENTAL PROSTHETIC APPLIANCE

Jacob A. Saffir, Los Angeles, Calif., assignor to Dentsply Research & Development Corporation, Milford, Del.

Filed Jan. 29, 1971, Ser. No. 110,939

Int. Cl. A61c *13/00*

U.S. Cl. 32—2 **7 Claims**



1, A dental prosthetic appliance comprising artificial teeth attached to a denture base material wherein substantially all of the exposed surfaces of said denture base material thereof contains laminated thereto a layer of a polymerized fluorocarbon resin selected from the group consisting of fluorinated polyolefins and fluorinated polyvinylidene.

3,889,375

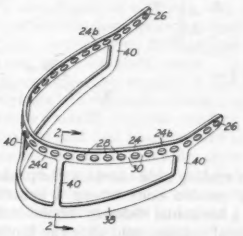
ONE PIECE PERMANENT SUPPORT FRAME FOR UPPER DENTURES AND PROCESS OF MOUNTING THE SAME

Harold Devere Roberts, 2717 N.E. Knott St., Portland, Oreg. 97212

Filed Jan. 2, 1974, Ser. No. 430,248

Int. Cl. A61c *13/00*

U.S. Cl. 32—10 A **11 Claims**



1. A permanent implant support frame for an upper denture comprising

a. a frame portion having forward and rearward ends,

b. said rearward end including an extended shank portion,

c. said frame portion forward of said extended shank portion being shaped longitudinally so as to be insertable in a channel cut longitudinally in the alveolar ridge of the upper jaw and said shank portion being of a length to extend through an aperture cut longitudinally in the pterygoid bone to accomplish a permanent implant mounting in the jaw,

d. and depending support means on said frame portion arranged for connection thereto of artificial denture means.

3,889,376

CROWN REMOVING DEVICE

Allen M. Zatkin, 5351-1/2 Topanga Canyon Blvd., Woodland Hills, Calif. 91364

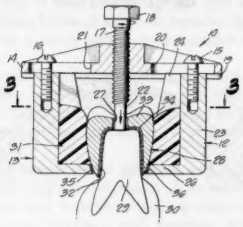
Filed May 6, 1974, Ser. No. 466,987

Int. Cl. A61c *3/00*

U.S. Cl. 32—41 **7 Claims**

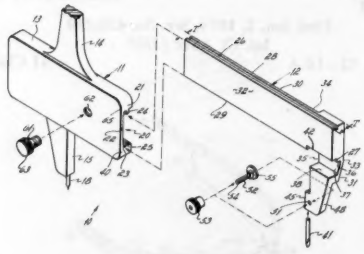
1. Crown removing apparatus, comprising: a pair of jaws for being received about the crown;

a material carried by the jaws and having a surface for contactingly gripping the crown, said surface being contoured to substantially the same shape as that of the crown being gripped; and



means interconnected with said jaws for exerting a force on said jaws in such direction as to remove said crown.

3,889,377
SLIDE COMPASS
Warren D. Novak, 325 Douglas Rd., Chappaqua, N.Y. 10514
Filed Jan. 9, 1974, Ser. No. 431,844
Int. Cl. B43l *9/04*
U.S. Cl. 33—27 C **16 Claims**



1. A direct reading slide compass comprising

an integral molded body having a generally flat central section, a horizontal slideway formed in the front face of said central section, said slideway having at least one vertical lip extending upwardly into said slideway and at least one vertical lip extending downwardly into said slideway, a rotation post section upstanding from said central section and terminating in an end cap adapted to be rotated between a person's thumb and one finger, a body foot section depending downwardly from said central section and having molded therein at least a portion of a means to receive a center needle, said means to receive said center needle being coaxial with a vertical axis through said rotation post,

a center needle mounted within said center needle receiving means of said body foot section,

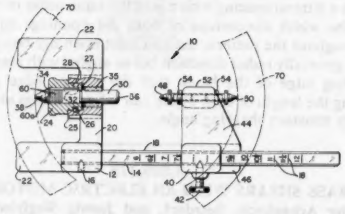
an integral molded slide comprising a transverse slide bar adjustably mounted within said slideway and having a marking foot section depending from one end thereof, said slide bar having means cooperable with said lips of said horizontal slideway to hold said slide within said slideway, said marking foot section having molded therein at least a portion of a means to receive a marking element, the upper portion of said marking foot section of said slide being located forwardly of the front face of said central section of said body and having a section extending rearwardly beneath the bottom wall of the central section of said body so as to define a channel in said slide adjacent said slide bar, said channel enabling the lower portion of said central section of said body to pass through said channel without interference between said marking foot section of said slide and said central section of said body so as to maximize the range of adjustment of said slide in said body,

a marking element mounted within said marking element receiving means of said marking foot, said marking element being parallel to said vertical axis through said rotation post,

at least one indicia scale located on the front face of one of said slide bar or said central section of said body, and

an index mark on the front face of the other of said slide bar or said central section of said body.

3,889,378
BRAKE DRUM AND DISC MICROMETER
William J. Senecal, Monson, Mass., assignor to Gulf & Western Manufacturing Company, New York, N.Y.
Filed June 28, 1973, Ser. No. 374,684
Int. Cl. G01b *5/02*
U.S. Cl. 33—143 R **5 Claims**

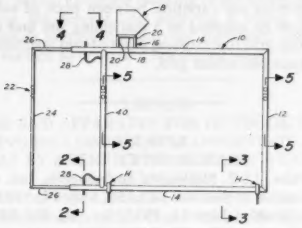


1. A brake drum and disc micrometer comprising an elongated rod, means fixedly secured to said rod and having an arm extending therefrom, first contact pin means movably supported in said arm parallel to said rod and having an outer end for engaging the inner surface of a brake drum and an inner end for engaging the outer surface of a brake disc, calibrated means for axially adjusting said pin means in said arm and for indicating the extent of movement thereof from a normal or "zero" position relative to the arm, a sleeve supported on said rod for movement thereon to predetermined fixed positions and having an arm extending therefrom, second contact pin means fixedly secured to the last mentioned arm in axial alignment with the first pin means and also having outer and inner ends for contacting the inner and outer surfaces of brake drums and discs respectively, the total length of said two contact pin means being known, the said rod is provided with a pair of calibrated scales along its length for reading brake disc thickness and brake drum inside diameter respectively with reference to the position of the sleeve on the rod, the disc thickness scale having a starting calibration indicative of the predetermined distance apart of the inner ends of the two contact pin means at one predetermined fixed position of the sleeve and with the first contact pin means set at its calibrated "zero" position, and the drum diameter scale having a coincident starting calibration which is larger than the starting calibration on the disc scale by the said known total length of said contact pin means.

3,889,379
AID FOR MAKING A BASEBALL BATTERS' BOX
Lee R. Cline, 156 Locust Ln., Cadiz, Ohio 43907
Filed Feb. 6, 1974, Ser. No. 440,259
Int. Cl. A63c *19/06*
U.S. Cl. 33—174 G **5 Claims**

1. A transportable device for use in making a baseball batters' box outline comprising: a U-shaped base frame having a pair of generally parallel legs connected by an end cross member, a pair of spaced apart pins hinged to one leg of said base

frame, a gauge bar generally parallel to said legs and spaced to the side of said other leg opposite from said one leg, means connecting said gauge bar to said other leg, a U-shaped closure frame having a pair of generally parallel legs connected



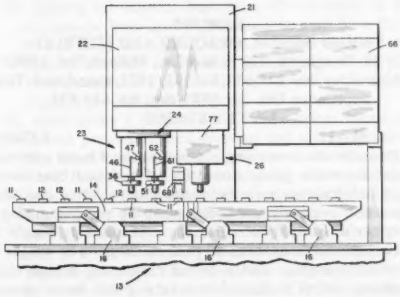
by an end cross member, said frames being positioned with their legs extending towards each other's base, and means slidably connecting said legs of said closure frame to respective legs of said base frame.

3,889,380

AUTOMATIC MEASURING MACHINE FOR CHECKING SIMILAR WORKPIECES WITH AT LEAST ONE DIMENSION DIFFERENT

Gastone Albertazzi, Bologna, Italy, assignor to Finike Italiana Marposs, Soc. In Accomandita Semplice di Mario Possati & C., Bentivoglio (BO), Italy

Filed Feb. 28, 1973, Ser. No. 336,831
Claims priority, application Italy, Mar. 3, 1972, 3354/72
Int. Cl. G01b *7/12*
U.S. Cl. 33—174 L **14 Claims**



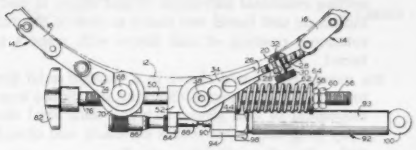
1. An automatic measuring machine for checking a series of similar workpieces of a plurality of types differing for at least one nominal dimension comprising pre-checking means adapted to identify the type; a measuring unit having adjustable measuring means; and control means coupled to said pre-checking means and to said measuring unit to adjust said measuring means for carrying out, measurements on said plurality of types of workpieces.

3,889,381

GAGE FOR MEASURING THE CIRCUMFERENTIAL EXPANSION OF INTERNALLY PRESSURIZED TUBES

Bruce B. Brown, Latham, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 10, 1974, Ser. No. 459,767
Int. Cl. G01b *5/08*
U.S. Cl. 33—179 **7 Claims**



1. A gage for measuring the circumferential expansion of a tubular member subjected to internal stressing, comprising,

a pair of rods transversely spaced in parallel relation,

first and second blocks slidably mounted on said rods at spaced-apart locations thereon,

a reference block having an adjustable reference surface thereon and fixedly mounted on said rods intermediate said first and second blocks,

spring means mounted on said rods in position to normally urge said second block into mating contact with said reference block,

a roller chain having the ends thereof respectively secured to said first and second blocks to permit circumferential engagement with the exterior periphery of the tubular member at any point along the length thereof,

a measuring device having a housing secured to said second block in parallel alignment with said rods and a spring-biased plunger slidably disposed in said housing to extend therefrom into contact with said adjustable reference surface on said reference block, and

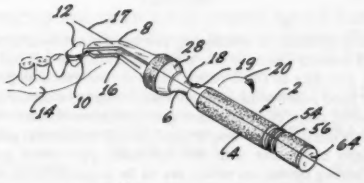
an actuating screw threadably engaged in said first block to project therefrom into rotatable retention with said fixed reference block whereby clockwise rotation of said screw initially advances said first block toward said reference block to take up the slack in said roller chain and thereafter actuates said first block along said rods to transmit corresponding slidable movement to second block for compressing said spring means to impart a desired preload thereto prior to the operation of said measuring device in response to circumferential expansion of the tubular member.

3,889,382

MICROMETER TOOTH MEASURING APPARATUS

Paul R. Husted, 201 Calle Miramar, and Felix Galan, 1935 Condon Ave., both of Redondo Beach, Calif. 90278

Filed Mar. 25, 1974, Ser. No. 454,756
Int. Cl. G01b *3/10, 3/18*
U.S. Cl. 33—179 **12 Claims**



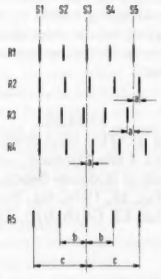
1. An apparatus for measuring the circumference of a tooth, said apparatus comprising:

a barrel;
a sleeve rotatably positioned about said barrel and in threaded engagement therewith;
guide means positioned at a forward end of said barrel;
a doubled band slidably positioned within said guide means; said guide means including an opening with the portions of said doubled band which extend beyond the opening forming a closed loop;
means connecting said band and said sleeve to transmit axial movement of said sleeve to said band without transmitting rotational movement of said sleeve to said band; indicia on said barrel and sleeve to denote the axial and rotational position of said sleeve with respect to said barrel;
the movement of said sleeve in a forward axial direction toward said guide means enlarging said closed loop while movement of said sleeve in a rearward axial direction away from said guide means contracts said closed loop, and
said indicia having an increasing numerical designation as said sleeve is moved in a forward axial direction toward said guide means and a decreasing numerical designation as said sleeve is moved in a rearward direction away from said guide means with the numerical designation of said indicia corresponding to the enlargement and the contraction of said loop in response to movement of said sleeve,
whereby the size of said closed loop may be varied by rotation of said sleeve with respect to said barrel with the size of said loop being indicated by said indicia which denote the axial and rotational position of said sleeve with respect to said barrel.

3,889,383
METHOD OF MACHINING PRINTED-CIRCUIT BOARDS AND/OR WORKING PATTERNS FOR SUCH PRINTED-CIRCUIT BOARDS

Alfred Jahn, Munich, Germany, assignor to Siemens Aktiengesellschaft, Germany

Filed Sept. 25, 1973, Ser. No. 400,530
Claims priority, application Germany, Sept. 28, 1972, 2247831
Int. Cl. G01b *5/24*
U.S. Cl. 33—180 R **3 Claims**

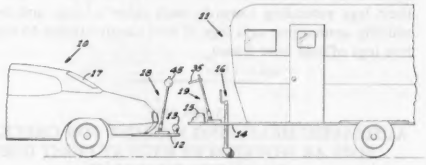


1. A method of machining printed circuit boards wherein each desired site of a machining operation is located on one of a plurality of fixed points in an actual machining pattern, said fixed point being located with respect to a theoretical grid crossing point of a reference grid system established for each said printed circuit board, said board reference grid being initially congruent with the reference placement grid of a machining device on which are to be located the actual sites of the machining operations of said device, comprising
determining the deviation in terms of direction and numerical value in one coordinate direction of each desired machining pattern site in a row with respect to a row of said theoretical reference crossing points on said printed circuit board reference grid;
selecting one of said desired points as the basic reference point for locating said machining operation relative to said machining device reference placement grid,
shifting said selected basic reference point and the corresponding crossing point of said printed circuit reference grid relative to said machining device tool placement grid to minimize the variation between each of said desired points to be adopted as a machining site and the corresponding grid row crossing point of said machining device reference placement grid.

3,889,384
TRAILER HITCH GUIDE

Max A. White, 12 E. Minnesota, Indianapolis, Ind. 46225

Continuation of Ser. No. 143,556, May 14, 1971. This application June 14, 1973, Ser. No. 369,887
Int. Cl. G01c *5/00*
U.S. Cl. 33—264 **8 Claims**



2. The guide of claim 1 wherein each of said ridges is V-shaped and has an inside diameter less than the diameter of said hollow center.

3,889,385
LIQUID DENTAL OPAQUER AND METHOD

Emery W. Dougherty, 123 School Ln., Milford, Del. 19963

Division of Ser. No. 225,657, Feb. 11, 1972, abandoned. This application Oct. 31, 1973, Ser. No. 411,535
Int. Cl. A61c *5/08*
U.S. Cl. 32—12 **3 Claims**

1. Dental work comprising in combination a metal substrate selected from the group consisting of a dental base metal alloy, a nobel metal or a nobel metal alloy; a dental opaquing composition overlying said metal substrate and comprising a copolymer of from about 20 to about 60 parts by weight of acrylonitrile and from about 40 to about 80 parts by weight of methyl methacrylate, and a dental crown and bridge resin comprising metayl methacrylate overlying said dental opaquing composition.

2. A method of preparing crown and bridge prosthesis comprising the steps of opaquing prepared dental base metal alloy, nobel metal, or nobel metal alloy dental work by applying a solution having dissolved therein methacrylic acid, a copolymer of from about 20 to about 60 parts by weight of acrylonitrile and from about 40 to about 80 parts by weight of methyl methacrylate, and an adhesion promoting compound selected from the group consiting of carbethoxy propyl methyl diethoxy silane, diphenyl diethoxy silane, dimethyl dichloro silane, and gamma-methacryloxypropyltrimethoxysliane having the formula

and having dispersed therein a sufficient quantity of opaquing pigment to permit complete masking of the dental metal work, evaporating the solvent and applying a crown and bridge dental resin in methyl methacrylate monomer vehicle to the opaqued surface to complete the dental work.

3,889,386

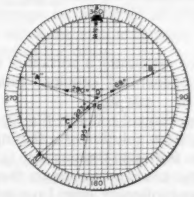
METHOD AND APPARATUS FOR OUTDOOR POSITION LOCATING INCLUDING DEVELOPMENT OF AN AREA MAP BY RELATIVE BEARINGS OF VISIBLE LANDMARKS

Leslie A. Hurd, 2616 Columbus, Moskogee, Okla. 74401

Continuation-in-part of Ser. No. 341,802, March 16, 1973, abandoned. This application Mar. 6, 1974, Ser. No. 448,784

Int. Cl.[2] G01C *15/00*

U.S. Cl. 33—228 **3 Claims**



1. The method of establishing outdoor locations by plotting relatively known positions on a chart, together with the relative positions of surrounding landmarks to create a map with fixed locations thereon and determining another position or course and distance therefrom to another position on the map, comprising:

A. establishing as a base a first field outdoor location and plotting the position thereof as a first fixed position on a circular chart, having thereon distance coordinates and a cooperative 360° protractor with angular bearing markings;

B. sighting the angular disposition of a plurality of distant landmarks from and with respect to said base location, and plotting the sighted angles as projected lines of position on the chart to establish by a fix of the lines of position on the chart the base location and relative angular disposition of said landmarks;

C. establishing a second fixed field outdoor location at a known pre-determined distance and direction from said first fixed location, and plotting the so established second fixed field location on said circular chart, wherein the second fixed field outdoor location is established by placing markers 46 feet apart at said first fixed location and moving outwardly, in a direction which is both perpendicular to a line connecting said markers and along a line of fixed degree, to a third point where these markers show to be exactly one degree apart, said third point thereby being known to be one mile distant from said first location.

D. determining angular bearings from said second fixed location to at least two of the same said distant landmarks;

E. plotting the so last determined respective angular bearings from the distant landmarks to said second fixed location as projected lines therefrom on the chart;

F. plotting as fixes at the intersections of the lines from the two respective fixed locations to the respective landmarks the locations of the landmarks on the chart which thereupon constitutes a map; and

G. determining from the map the direction and distance to a desired position on the map.

3,889,387

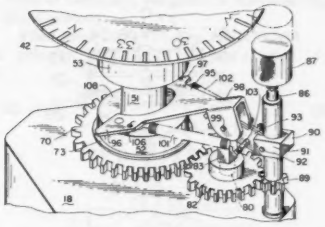
DIRECTIONAL GYROSCOPE

Frederick J. Owens, Butler, N.J.; Jerry B. Bishop, Wichita, Kans., and David Fidelman, Denver, Colo., assignors to Aerosonic Corporation, Clearwater, Fla.

Filed July 7, 1971, Ser. No. 160,334

Int. Cl. G01c *19/32, 19/34*

U.S. Cl. 33—318 **2 Claims**



1. In a directional gyroscope having a driving gear and a driven gear, a dial shaft secured to the driven gear and carrying a dial hub slidably journaled thereon and having clutch means fixed on the shaft normally engaged with said dial hub to rotate therewith, and a dial secured to the dial hub, dial reset mechanism comprising a

clutch gear rotatable on the dial shaft and positioned to be engageable by the dial hub, and

means for disengaging the dial hub from the dial shaft and for engaging the dial hub with the clutch gear, said disengaging and engaging means comprising a stub shaft and a dial reset shaft parallel to said dial shaft, an idler gear and a pinion gear on said stub shaft and said reset shaft, respectively, an actuating arm pivotably connected to the stub shaft and having winged portions engageable with said dial hub, a linkage member connected at one end to the stub shaft-actuating arm pivotal connection and at the other end to the dial reset shaft, said linkage member including a lost-motion connection therein, the pinion gear being connected for rotating the idler gear, and, in turn, the clutch gear and the dial upon contact of the actuating arm winged portions with the dial hub and upon contact of the dial hub with the clutch gear, and a pair of springs connected to the actuating arm winged portions and to the linkage member for moving the end of the linkage member connected to the dial reset shaft in overcenter relationship with respect to the arm and stub shaft pivotal connection upon depression of said dial reset shaft to slidably move said dial hub into engagement with said clutch gear for resetting the dial separate from the driving and driven gears and the dial shaft.

3,889,388

METHOD OF AND DEVICE FOR DRYING SMALL SOLIDS

Eizo Oguri, Kobe; Hiroshi Ogawa, Hyogo; Koki Date, Hyogo, and Kanji Takeba, Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 162,457, July 14, 1971, abandoned. This application Jan. 4, 1974, Ser. No. 430,928

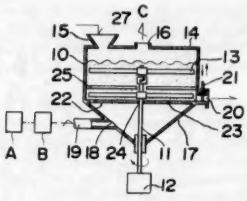
Claims priority, application Japan, July 17, 1970, 45-62965

Int. Cl. F26b *3/08*

U.S. Cl. 34—10 **5 Claims**

1. A method of drying granular or crystalline particles which initially have a relatively high moisture content as compared to the moisture content after they are dried and which particles tend to stick together to form lumps during the dry-

ing thereof, and which particles are delicate and subject to damage by striking the parts of a dryer apparatus at high velocities, said method comprising the steps of feeding the proper amount of undried particles into a shell of a drier to form a bed of particles in the shell, the drier having therein means for stirring the bed of particles thus fed by applying a horizontal fluidized bed shearing force to the bed of particles, actuating said means for applying a horizontal fluidized bed shearing force to the fluidized bed at a speed for giving a gentle motion to said bed of said particles and insufficient for carryover of said particles which may cause a portion of said particles to splash on the inner surface of said shell of said



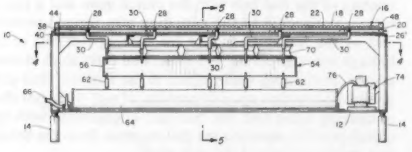
drier, and simultaneously with said application of said horizontal fluidized bed shearing force, feeding gaseous drying medium upwardly from the bottom of said bed of particles through the interstices among said particles at a velocity which is less than the minimum fluidizing velocity for an undisturbed bed of such particles when the particles have a moisture content from just above the critical moisture content to a moisture content just below the critical moisture content, the critical moisture content being the moisture content at which the particles tend to stick to each other, and a velocity which is greater than one half said minimum fluidizing velocity.

3,889,389

PARACHUTE DRYING APPARATUS

Alfred Serup, 1244 Nedra Dr., Granada Hills, Calif. 91344

Filed May 13, 1974, Ser. No. 469,059
Int. Cl. F26b *5/04*
U.S. Cl. 34—15 **20 Claims**



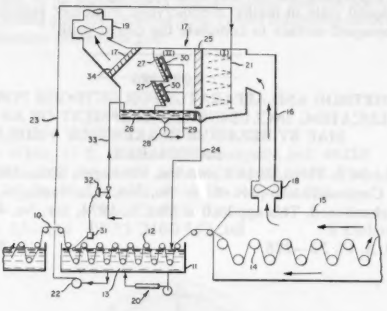
1. The method of drying a parachute comprising the steps of:
placing the parachute within a confined area;
applying heat to the confined area;
subjecting the confined area to a vacuum thereby causing moisture within the parachute to be vaporized;
causing the vaporized moisture to move within a minimized volume;
applying heat to the minimized volume expanding the vaporized moisture; and
removing the vaporized moisture from the minimized volume into an enlarged cooler volume due to the natural action of the expanding vaporized moisture to exceed the boundaries of the minimized volume.

3,889,390

REGENERATED CELLULOSE SOFTENER RECOVERY METHOD AND APPARATUS

Robert John Klare, Clinton, Iowa, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Oct. 18, 1974, Ser. No. 515,965
Int. Cl. F26b *3/00*
U.S. Cl. 34—23 **8 Claims**



1. In a process for reclaiming a portion of a softening agent used in treating regenerated cellulose film which process includes the steps of:
a. treating gel regenerated cellulose film by moving said film through an aqueous solution of softening agent;
b. drying the film from said treating step (a) by moving said film counter current to an air stream thereby transferring excess water and softening agent from said film to said air stream;
c. absorbing softening agent from the air stream of the drying step (b) by contacting said air stream with a mist of the aqueous solution of softening agent from said treating step (a) and evaporating water from said aqueous solution into said air stream;
d. returning the aqueous solution from said absorbing step (c) to the aqueous solution of said treating step (a);
the improvement of increasing the removal of said softening agent which consists in the additional steps of:
1. removing entrained droplets of aqueous solution and solid contaminants from the air stream of the absorption step (c);
2. further absorbing softening agent from the air stream of the preceding step by contacting said air stream with a mist of a separate, dilute aqueous solution of softening agent; and
3. adding water to said dilute aqueous solution of softening agent to replace process water losses.

3,889,391

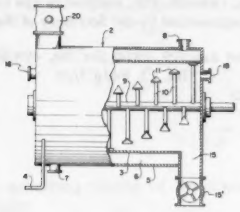
METHOD OF AND APPARATUS FOR DRYING PARTICULATE MINERALS FOR AGGLOMERATION

Donald B. Malcolm, Pittsburgh, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Feb. 28, 1974, Ser. No. 446,715
Int. Cl.[2] F26B *3/00*
U.S. Cl. 34—33 **5 Claims**

1. Apparatus for reducing the moisture content in filter cake comprising:
a. a high intensity mixer having a horizontally-extending drum with a charging opening at one end and a discharge opening at the other end, the drum having a smooth interior surface and having an axial shaft therein with radial arms arranged therealong and spaced thereabout, the arms having plows that have a working clearance with the interior of the drum, the drum having means about the exterior thereof for heating the interior walls thereof,

b. feeder means for introducing material to be dried at a controlled rate into one end of the drum while excluding the free influx of outflow of air, and means adjacent the bottom of the drum for discharging material which has been at least partially dried at a controlled rate from the other end of the drum while also preventing the free



influx or outflow of air therethrough whereby controlled flow into and out of the drum may be effected, and

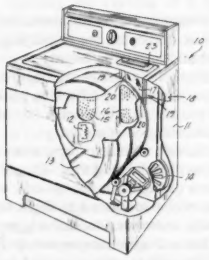
c. the drum having means for controlling the circulation of air therethrough including an air inlet at the end of the drum into which material is charged and an outlet at the opposite end of the drum.

3,889,392

SELF-ALIGNING INTEGRAL LINT SCREEN HANDLE AND LID FOR A DRYER

Rodney L. Davis, Stevensville; Don Ray Cronk, Benton Harbor, and Carl C. Hansen, Watervliet, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Oct. 9, 1974, Ser. No. 513,309
Int. Cl. F26b *21/06*
U.S. Cl. 34—82 **7 Claims**



1. A removable lint screen assembly for use in a dryer having a chute for receiving the lint screen assembly through an opening in the dryer cabinet, said lint screen assembly comprising:

a first part including a lint screen and attached lint screen frame;

a second part including a handle and lid member having a hand grip portion and a cover portion for covering said cabinet opening; and

attachment means for providing a limited-travel ball-joint connection between said first and second parts and including,

a projection extending between said first and second parts and having opposite first and second end portions with a shank portion therebetween, and

an aperture defined in one of said parts loosely encompassing said shank portion,

said first end portion of said projection rigidly affixed to the other of said parts,

said second end portion of said projection defining a hook for loosely engaging said other of said parts adjacent said aperture,

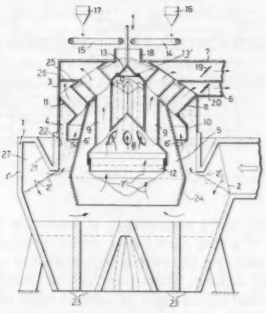
whereby the limited-travel ball-joint attachment between said first and second parts ensures a proper alignment between said handle and lid member and said cabinet when said lint screen assembly is in place in said dryer.

3,889,393

DEVICE FOR THERMICALLY TREATING GRANULAR AND/OR LUMPY MATERIALS

Hans Peter Thomas, Dornap, and Heinrich Buchner, Niederkassel, both of Germany, assignors to Klöckner-Humboldt-Deutz AG, Germany

Filed Mar. 20, 1974, Ser. No. 453,058
Claims priority, application Germany, Apr. 5, 1973, 2317056
Int. Cl. F26b *17/14*
U.S. Cl. 34—167 **10 Claims**



1. A device for thermically treating a granular and lumpy material such as calcite, limestone, dolomite and magnesite by passing a gaseous medium therethrough, said device comprising in combination a chamber having an upper end with a flanged opening and a lower end with at least one discharge opening, said chamber having at least one wall extending between said ends with at least one opening in the wall for admitting a gaseous medium into the chamber; and means mounted on the upper end of the chamber and aligned with the flanged opening for supplying material to the chamber and for removing the gaseous medium therefrom, said means for supplying material including at least two separate gas discharge conduits disposed in an upper portion thereof, first means for coacting with the flanged opening of the chamber to provide at least two coaxially extending material supply channels which project into the chamber to different depths, and a collection hood disposed in the innermost coaxially extending supply channel, said hood being provided with a plurality of first gas exhaust pipes communicating with one of the separate gas discharge conduits, said means for supplying having second means for separately connecting the remaining supply channels to the other of the separate gas discharge conduits.

3,889,394

HEAT SHRINK APPARATUS

Kenneth J. Fischer, Henderson, Ky., assignor to Fox Valley Corporation, Appleton, Wis.

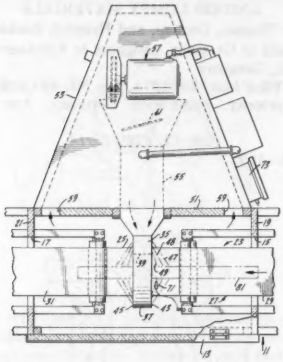
Filed June 4, 1973, Ser. No. 366,496
Int. Cl. F26b *19/00*
U.S. Cl. 34—225 **10 Claims**

1. Apparatus for heat shrinking a plastic film enclosing an elongated object,

said apparatus including:

means to move an elongated object loosely enclosed in a shrinkable plastic film along a defined path which path is generally coincidental with the longitudinal axis of said elongated object,

a plurality of nozzles encircling a portion of said path and arranged to discharge heated fluid against a peripheral band of said film as said object moves along said path and past said nozzles,



said nozzles being arranged in at least one ring with the nozzles of a ring each being spaced generally uniformly around said ring and each being positioned approximately an equal distance from said film to thereby discharge heated fluid against said peripheral band of film at temperatures and pressures which are generally uniform over the area of the peripheral band,

said nozzles being arranged to discharge said heated fluid against said film enclosing said elongated object with said heated fluid discharging in a direction opposite and obliquely to the path of movement of said film enclosed object.

3,889,395

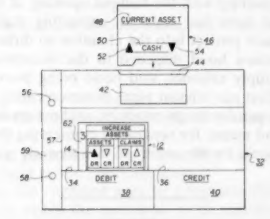
TEACHING AID FOR ACCOUNTING

Snyder M Zegel, 108 Monell Ave., Islip, N.Y. 11751

Filed Apr. 19, 1974, Ser. No. 462,439

Int. Cl. G09b *19/18*

U.S. Cl. 35—24 R **11 Claims**



1. A teaching device useful as an aid in teaching the rudimentary principles of accounting comprising:

a. a plurality of rectangular transaction cards, each card bearing accounting indicia;

b. a plurality of ledger pages, each page including, in juxtaposition, a left debit pocket and a right credit pocket for receiving appropriate transaction cards;

c. a plurality of account title tags; and

d. a slot at the top of each ledger page for receiving and displaying said title tag.

3,889,396

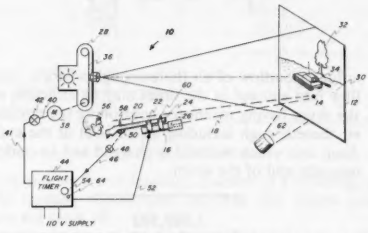
DIRECT FIRE WEAPONS SIMULATOR

Moses Aronson, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 19, 1974, Ser. No. 498,696

Int. Cl. F41g *3/26*

U.S. Cl. 35—25 **4 Claims**



1. An improved direct fire weapons simulator comprising

a trainee controlled trigger fire weapon having an "on-off" switching circuit operated from said trigger and a projectile barrel,

a projection screen coated with photochromic material,

a motion picture projector for displaying on said screen a background and a moving target,

an illuminator selected to project a beam of wave length less than 480 nanometers and affixed to said weapon to direct said beam parallel to the barrel of said weapon in the direction said weapon is aimed,

a flight timer having instructor operable adjustment means to set the timer for delayed time outputs corresponding to the equations of flight for the specific cartridge or round and weapon to be simulated in flight time to the target,

said timer being connected to said trigger operated switching circuit for activation responsive to firing said weapon and to said illuminator to cause said delayed time output signals to activate said illuminator and produce a darkened hit spot on said screen at a point in relation to said moving target dependent upon the accuracy of aiming of said weapon.

3,889,397

DEVICE FOR COMPOSING TRACEABLE FORMS

Janet M. Flood, 323 Medford Ave., Hayward, Calif. 94541

Filed Sept. 23, 1974, Ser. No. 508,688

Int. Cl. G09b *11/04*

U.S. Cl. 35—26 **4 Claims**

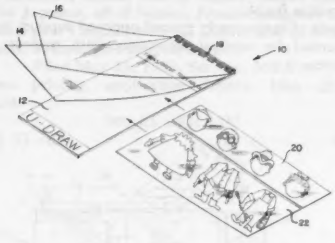
1. A device for composing designs, characters, forms and the like traceable with tracing paper composing:

a. A pad

b. A plurality of substantially transparent tabs having segments of the design, characters, form and the like imprinted thereon.

c. A plurality of transparent sheets, said tabs interposed said

pad and said transparent sheets such that the segments of said tabs are visible when viewed through said sheets to



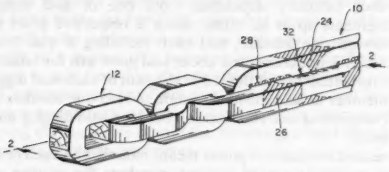
said pad permitting tracing of the segments with the tracing paper.

3,889,398

COLOR CODED WOOD CARVING STOCK AND METHOD

Stanley P. Orzel, 3320 Birney Ave., Scranton, Pa. 18503

Filed Dec. 19, 1973, Ser. No. 426,132
Int. Cl.[2] G09B *19/00*
U.S. Cl. 35—26 **3 Claims**



1. For use in teaching the carving of a chain formed by integral links from solid material, an elongated stock of predetermined cross-section perpendicular to a longitudinal axis having a plurality of external planar surfaces parallel to said axis and means for guiding removal of material from said stock to substantially form said chain, comprising markings on said planar surfaces of the stock defining two different groups of volumetric sections longitudinally spaced along the stock, said markings being color coded to render the two groups of volumetric sections visually distinguishable from each other, one of said groups of volumetric sections being completely defined substantially by the markings on all of said planar surfaces, the other of the groups of volumetric sections extending internally through the stock between markings on less than all of said planar surfaces and when removed from the stock forming pairs of parallel slots in the stock aligned with planes transverse to each other, said integral links of the chain being disposed parallel to said transverse planes.

3,889,399

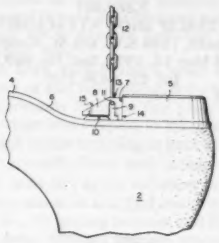
BOOT HANGING DEVICE

Roy P. Emrich, San Francisco, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Sept. 3, 1974, Ser. No. 502,457
Int. Cl. A43b *00/00;* **A43d** *3/00*
U.S. Cl. 36—1 **3 Claims**

1. A boot hanging device for hanging a boot upside down from an external projection to air out and dry, the boot having a sole, a heel and an arch area therebetween with the heel having a substantially planar front surface at substantially right angles with the sole and defining the arch area with the sole, said boot hanging device comprising

a block type member affixed to the boot in the arch area thereof and abutting the front surface of the heel, the block type member having a slot formed therein opening from a surface thereof affixed to the boot in a manner



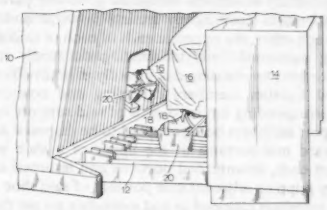
whereby the slot releasably accommodates an external hook therein for hanging the boot from an external projection.

3,889,400

SHOE ATTACHMENT FOR OPERATING ORGAN PEDALS

Mary T. Atzinger, 932 Wabank St., Lancaster, Pa. 17603

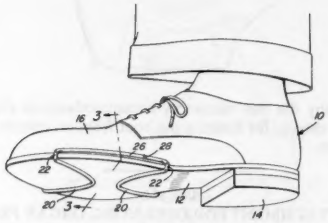
Filed Sept. 9, 1974, Ser. No. 504,568
Int. Cl.[2] A43B *3/12*
U.S. Cl. 36—7.5 **4 Claims**



1. A non-walking attachment for shoes for use by children and adults of short stature to lengthen the effective length of their legs to enable them to reach the lower pedals of an organ and actuate the same, said attachment means comprising a substantially non-compressible block-like member of material lighter in weight than leather and of substantially uniform and appreciable thickness much greater than the thickness of the sole of a shoe to which it is attached and in plan view being substantially as wide as the sole of the shoe of the wearer and only as long as the sole of such shoe from the front tip thereof to the forward face of the heel and substantially complementary to the shape of the sole and instep portion of the shoe to which it is to be attached, the forward end of said block-like member also being rounded to correspond to the rounded forward end of the sole of the shoe to which the attachment is to be connected and the sides and ends of said member tapering inward and downward from the upper surface thereof to provide a lower surface adapted to engage individual pedals of an organ without interference with adjacent pedals while the wider and longer upper surface of said block-like member affords firm flat abutment with the shoe of the wearer, thereby to resist twisting movement of said member laterally sidewise relative to such shoe while operating the pedals of an organ, the rearward upper end of said member also being adapted to abut at least part of the forward face of the heel of such shoe to resist rearward movement of said member relative to said shoe, band-like attaching means connected to the forward portion of said member and adapted to extend over the toe of the shoe of the wearer, and additional attaching means adjacent the rear end of said member adapted to engage the rear and instep portions of such shoe to attach said member to such

shoe and maintain the rear end of the attachment against said forward face of the heel of the shoe of the wearer.

3,889,401
ANTI-SLIP SHOE ATTACHMENT
Dion C. McDonnold, 1140 S.W. 6th St., Cooper, Tex. 75432
Filed May 14, 1974, Ser. No. 469,909
Int. Cl. A43b *3/10*
U.S. Cl. 36—7.6 **9 Claims**



1. A shoe sole attachable traction aid, said aid including a pair of generally horizontal elongated generally parallel support members at least slightly arcuate in shape and opening toward each other, the opposite ends of each of said members including outturned ends terminating outwardly in downturned portions terminating downwardly in inturned ends, and elongated traction members extending and connected between corresponding inturned ends of said support members, said support members being adapted to be disposed alongside the forward mid-portions of the upper of a shoe with said outturned ends, downturned portions and inturned ends embracingly gripping adjacent sole portions of said shoe and said traction members clamped to and extending across the undersurface of the sole of said shoe.

3,889,402
SHRUB BALLER WITH ARTICULATED DIGGER SUPPORT MEMBERS
Robert P. Wheeler, Rt. 3, Box 516, Estacada, Oreg.; Jeffrey P. Wheeler, 1200 E. Powell, Gresham, Oreg. 97030, and Henry D. Wheeler, 209 Taylor, Apt. 21, Moscow, Idaho 83843
Filed Sept. 25, 1973, Ser. No. 400,536
Int. Cl. A01g *23/04*
U.S. Cl. 37—2 R **10 Claims**

1. A mobile machine for digging and balling nursery shrubs comprising:

a. a mobile straddle carrier frame comprising a pair of transversely spaced vertical side frame members joined at their tops by a horizontal cross member so as to define an interior space within said members extending throughout the length of said frame and being open on both ends and at the bottom;

b. a pair of transversely spaced support members, each mounted on a respective one of said side frame members on either side of said interior space;

c. power means mounted on said frame for vertically reciprocating said transversely spaced support members in unison with respect to said frame;

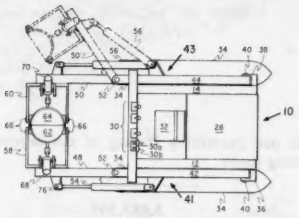
d. a pair of complementary digging members, each depending from a respective one of said transversely spaced support members; and

e. second power means mounted on each of said transversely spaced support members for selectively moving said support members toward or away from one another.

4. A mobile machine for digging and balling nursery shrubs comprising:

a. a mobile frame;

b. a pair of transversely spaced opposed support members mounted for vertical movement with respect to said frame;



c. first mechanical power means for selectively raising and lowering said support members with respect to said frame;

d. a pair of opposed complementary digging members, each pivotally depending from one of said support members sp as to rotate about a respective pivot axis toward one another, and each including a wall means which is not concentric about said pivot axis for retaining substantially all of the soil in the path of each said digging member as said members rotate toward one another and compacting said retained soil between said digging members;

e. second mechanical power means mounted on each of said transversely spaced support members for moving said support members toward or away from one another; and

f. third mechanical power means mounted on each of said support members for selectively rotating the bottom edges of said respective digging members about said respective pivot axes toward one another.

6. A mobile machine for digging and balling nursery shrubs comprising:

a. a mobile straddle carrier frame comprising a pair of transversely spaced vertical side frame members joined at their tops by a horizontal cross member so as to define an interior space within said members extending throughout the length of said frame and being open on both ends and at the bottom;

b. a pair of transversely spaced, forwardly extending arms mounted along either side of said frame and pivotally connected thereto for rotation about a common transverse pivot axis;

c. first power means interacting between said frame and said arms for selectively raising or lowering said forwardly extending arms in unison aboaut said pivot axis;

d. a pair of transversely spaced arm extension sections extending forwardly in front of said frame, each pivotally mounted to the forward end of a respective one of said arms so as to rotate transversely inwardly and outwardly with respect to the longitudinal centerline of said machine so as to form, in combination with said arms, a pair of transversely articulated support members extending along either side of said frame;

e. second power means connected to said respective extension sections for selectively pivoting said extension sections inwardly or outwardly; and

f. a pair of complementary digging means, each mounted on the forward end of a respective one of said extension sections, for digging into the ground at opposed locations to one another.

3,889,403
METHOD AND APPARATUS FOR CONTINUOUS UNDERWATER MINING USING PLURAL SHIPS

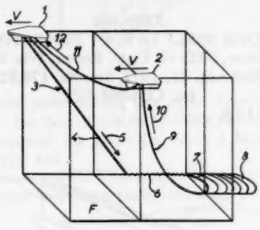
Michel Gauthier, Renan; Marcel Tessier; Daniel Fleruy, and Michel Jegousse, all of Nantes, France, assignors to Centre National pour l'Exploitation des Oceans and Le Nickel, both of Paris, France, part interest to each

Filed May 15, 1973, Ser. No. 360,594

Claims priority, application France, May 25, 1972, 72.18636

Int. Cl. E02f *5/00*

U.S. Cl. 37—69 **8 Claims**



1. A method for the continuous extraction of solid products from a sea bed using at least one endless dredging line having buckets attached thereto, comprising lowering said endless line down to the sea bed from a first ship, causing said buckets to dredge the surface of said sea bed, raising said line upwardly to a second ship traveling along a generally parallel course to said first ship after dredging the surface of said sea bed, returning said line from said second ship to said first ship along a return path which is at least partially submerged and varying the curvature of said line returning to said first ship to control a dredging parameter.

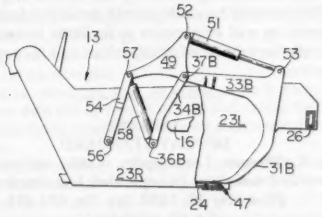
3,889,404
HOEING APRON MECHANISM

Larry G. Eftefield, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 20, 1973, Ser. No. 398,989

Int. Cl. E02f *3/62, 3/64*

U.S. Cl. 37—126 AD **8 Claims**



1. In a scraper having a bowl with sidewalls and an open forward end for receiving material to be loaded, a hoeing mechanism for assisting the movement of material into said bowl comprising:

an apron member disposed transversely in the forward portion of said bowl, said apron member having a pair of arms rigidly fastened thereto and extending rearwardly therefrom at opposite sides thereof,

a pair of forward links each having a lower end coupled to a separate one of said bowl sidewalls by first pivot means enabling the upper ends of said forward links to be swung forward and backward,

second pivot means coupling the upper end of each of said forward links to the adjacent one of said apron member arms,

first motor means for selectively swinging said upper ends of said forward links in a forward and backward direction to shift said apron member forwardly and backwardly relative to said bowl,

a pair of rear links, each having a lower end coupled to a separate one of said bowl sidewalls by third pivot means situated rearwardly from the first pivot means and each having an upper end coupled to the adjacent one of said arms through means including at least fourth pivot means situated rearwardly from said second pivot means to cause said arms and apron members to turn about said second pivot means as said first motor means swings said forward links, the spacing between said first and third pair of pivots being constant and the spacing between said second and fourth pivots being constant, whereby actuation of said first motor means alone drives said apron in a nonarcuate path, and

second motor means for selectively pivoting said apron member about said second pivot means.

3,889,405
EXCAVATOR WITH TEETH COUPLED FOR PIVOTAL MOVEMENT IN OPPOSITE SENSES

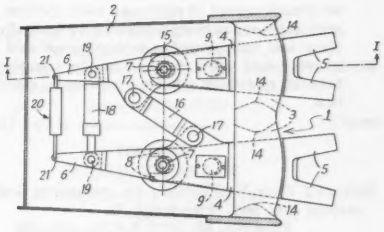
Daniel G. Ranini, Varreddes, France, assignor to Poclain, Oise, France

Filed Apr. 23, 1974, Ser. No. 463,395

Claims priority, application France, May 15, 1973, 73.17566

Int. Cl. E02f *3/40, 9/28*

U.S. Cl. 37—141 R **7 Claims**



1. In a ground penetration working tool,

a blade intended to penetrate a mass of material,

at least two teeth,

means pivotally securing each of said teeth to the blade about an axis extending perpendicularly to the plane of the blade so that each tooth projects from the blade,

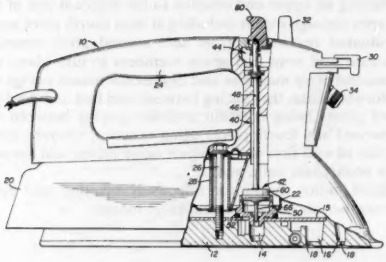
coupling means for coupling the two teeth for synchronized pivotal movement in opposite senses,

actuating means connected to the teeth and operable to cause the teeth to pivot towards and away from one another,

said actuating means includes a single driving element coupled to the said two teeth at points lying on the same side of a common plane containing the said pivotal axes of the two teeth, and wherein the coupling means comprises

a rod of constant length pivotally coupled to the two teeth at two points lying on opposite sides of said plane.

3,889,406
STEAM IRON WATER VALVE AND MANUAL OPERATING MECHANISM THEREFOR
James R. Chivers, North Canton, and William C. Pound, Canton, both of Ohio, assignors to The Hoover Company, North Canton, Ohio
Filed Oct. 7, 1974, Ser. No. 512,467
Int. Cl.[2] D06F *75/06*
U.S. Cl. 38—77.83 **6 Claims**

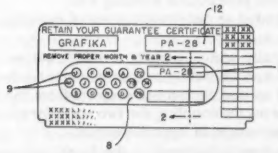


1. In a steam-dry iron having a soleplate with at least one steam discharge port, a water reservoir located above said soleplate, a steam generating chamber in fluid communication with said water reservoir, and a steam distribution passageway interconnecting said steam generating chamber and said steam discharge port, the improvement comprising,

a valve member regulating the fluid communication between said water reservoir and said steam generating chamber and having at least three colinear spaced positions consisting of a dry position, a limited flow position and a maximum flow position so as to regulate flow of water from said water reservoir to said steam generating chamber,

a valve operating member interconnected to said valve member, said valve operating member being adapted to be linearly moved to place said valve member in one of said positions and being adapted to be manually biased to place said valve member in another of said positions, whereby said valve member can be selectively moved between said three relative positions by manual operation.

3,889,407
WARRANTY PLAQUE
Bernard J. Elzer, West Reading, Pa., assignor to Grafika Commercial Arts, Inc., Wyomissing, Pa.
Filed Oct. 26, 1973, Ser. No. 410,028
Int. Cl. A44c *3/00*
U.S. Cl. 40—2 R **5 Claims**



1. A warranty plaque comprising a base layer, an intermediate layer and a cover layer;

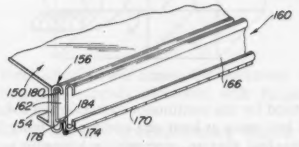
the base layer comprising an opaque plastic film having a pressure-sensitive adhesive on its lower surface;

the intermediate layer being comprised of a transparent plastic film having its lower surface adhered to the upper surface of the base layer and carrying printed intelligence on its upper surface;

the upper layer being a protective transparent plastic film adhered to the upper surface of the intermediate layer; and

a central portion of the intermediate layer and a corresponding central portion of the overlying cover layer bearing die cut lines that permit detachment of the central portion of the intermediate layer and the corresponding central portion of the overlying cover layer from the base layer and the surrounding portions of the intermediate and the upper layers.

3,889,408
STOCK SHELF LAYOUT INDICATORS
Burton E. Offner, 3023 St. Clair, Racine, Wis. 53402
Filed Aug. 11, 1971, Ser. No. 170,928
Int. Cl. G09f *3/18*
U.S. Cl. 40—10 R **12 Claims**



1. Shelf stock layout indicia means adapted for use to present a diagrammatic representation of a predetermined linear pattern of items to be stocked on a shelf,

said indicia means comprising:

strip means having at least one face receptive to application of visual data thereon,

indicia means shielding means selectively shiftable between a position in which said indicia means is visually obstructed and a position in which said indicia means is visually exposed,

product information displayed on said face of said strip means,

said product information defining a linear array of stock items along the length of said strip means,

items depicted in said array being spaced along said strip means to correspond with lineal placement positions of correlated actual items to be stocked along said shelf,

whereby in checking inventory and in stocking said shelf, reference may be made to said product information displayed on said strip means to facilitate inventory procedures, preparation of stock orders, and the restocking of shelves.

3,889,409
DISPLAY STANDARD
Robert E. Thomas, Los Angeles, Calif., assignor to John Graves and Associates Incorporated, Los Angeles, Calif.
Filed May 20, 1974, Ser. No. 471,353
Int. Cl. G09f *03/14*
U.S. Cl. 40—11 A **1 Claim**

1. A display standard, comprising:

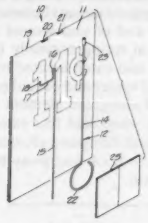
a first rodlike element having an end portion bent back along itself to form a loop with the terminal end portion formed to extend at substantially 90° to the remainder of the rodlike element;

a cross-brace formed by said terminal end portion extension;

a second rodlike element having an end portion bent into a loop;

a hollow tube received on the unbent end portions of said first and second rodlike elements removably interconnecting them together;

a sheetlike panel folded onto itself along a fold line, said panel including a pair of openings on said fold line located at equal distances from the fold line midpoint;



said sheetlike panel having one of its openings being received on the loop of said first rodlike element and otherwise supported for generally vertical hanging by the cross-brace; and

an adhesive coated member received onto the second rodlike element loop for securing the same to a surface.

3,889,410

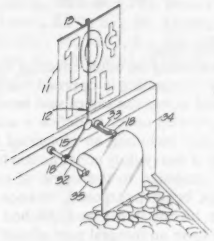
DISPLAY STANDARD

Robert E. Thomas, Los Angeles, Calif., assignor to John Graves and Associates Incorporated, Los Angeles, Calif.

Filed May 20, 1974, Ser. No. 471,354

Int. Cl. G09f *03/14*

U.S. Cl. 40—11 A **1 Claim**



1. A standard for displaying a sheetlike item having an opening therein, comprising:

an elongated member shaped about substantially its midpoint into a triangle;

a U-shaped mounting foot attached to each member end portion with the open end of said feet facing each other, said feet being adapted for receipt onto spaced mounting means;

a first rodlike element having one end portion bent back along itself, said element bent portion being affixed to the elongated member such that the remainder of the element extends in a direction away from the member feet and substantially normal to a straight line interconnecting said feet;

a second rodlike element having an end portion formed back along itself into a loop;

a cross-brace affixed to the loop on said second rodlike element and arranged normally with respect to said second rodlike element and a portion of said loop extending beyond said cross-brace;

a hollow tube being received on the end portions of said first and second rodlike elements removably interconnecting them together;

said sheetlike item to be displayed having its opening being received on the loop of said second rodlike element and otherwise supported for generally vertical hanging by the cross-brace.

3,889,411

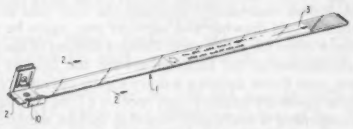
IDENTIFICATION BAND

Lorene Laugherty, and James R. Laugherty, both of Knoxville, Tenn., assignors to Laugherty Incorporated, Knoxville, Tenn.

Continuation-in-part of Ser. No. 240,139, March 31, 1972, Pat. No. 3,800,450. This application Jan. 10, 1974, Ser. No. 432,415

Int. Cl. G09f *3/14*

U.S. Cl. 40—21 C **3 Claims**



1. A kit for assembling an identification band, comprising an elongated transparent tube of a length to encircle a body member and to have the ends thereof folded over one another, means at one end of the tube for securing the folded over ends together, an elongated strip of material formed in one integral piece, said strip of material including a card portion at one end thereof, an intermediate pusher portion and a hand-hold portion at the opposite end of the strip from the card portion, means for separating the card portion from the pusher portion, said strip of material being of sufficient length when inserted in the tube to dispose one end of the card portion adjacent the securing means and with the opposite end of the pusher portion at the outer end of the tube and with the hand-hold portion projecting outwardly from the outer end of the tube, and indicia on the strip of material intermediate the pusher portion and the hand-hold portion for indicating the extent of insertion of the card into the tube.

3,889,412

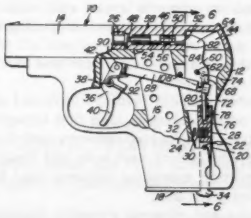
DOUBLE ACTION TRIGGER MECHANISM FOR SEMI-AUTOMATIC PISTOL

Joseph E. Filecci, 7330 Bellemeade Blvd., Miami, Fla. 33138

Filed Nov. 26, 1973, Ser. No. 419,120

Int. Cl. F41c *19/00*

U.S. Cl. 42—69 B **7 Claims**



1. A firearm of the double action type, said firearm comprising a frame, a trigger pivotally supported in said frame, said trigger including a lower finger engageable portion below the trigger pivot and an upper portion above the trigger pivot, a drawbar having a forward end pivotally anchored to said upper portion, a hammer pivotable in said frame for movement between cocked and firing positions and including upper and lower portions above and below the hammer pivot, the rear end of said drawbar being vertically swingable below said hammer lower portion, said rear end of said drawbar and the lower hammer portion including first coacting engageable

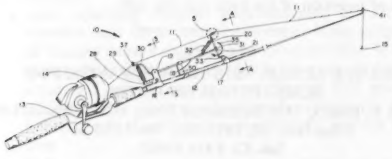
portions for moving said hammer lower portion forward to a predetermined forward position with said hammer in said cocked position in response to forward shifting of said drawbar and subsequently releasing said hammer for movement to the firing position thereof in response to further forward movement of said drawbar, means yieldingly urging said hammer toward said firing position, spring means connected between said trigger and drawbar yieldingly urging inverse pivotal movement of said trigger and drawbar to swing the lower portion of the trigger forwardly and the rear end of said drawbar upwardly, and the rear end of said drawbar and the lower portion of said hammer including second coacting portions operable to cam the rear end of said drawbar downwardly beneath the lower end of the hammer when the lower end of the trigger is swung to its forwardmost position and the drawbar is shifted rearwardly, whereby the rear end and lower portions of said drawbar and hammer may again be engaged with each other for subsequent forward shifting of the drawbar and movement of the hammer toward the cocked position thereof, said frame defining a downwardly opening passage in which to upwardly telescopingly receive a load clip, said drawbar comprising a rearwardly opening forked member whose opposite side arms extend along opposite sides of and embrace said passage, the rear ends of said arms, rearward of said passage, being directed toward each other and defining said rear end of said drawbar.

3,889,413

FISHING LINE JERKING DEVICE

Robert T. Snider, 1452 English, Indianapolis, Ind. 46201, and Jessie G. Zimmerman, 1742 N. Rural, Indianapolis, Ind. 46218

Filed Jan. 4, 1974, Ser. No. 430,680
Int. Cl. A01k *97/00*
U.S. Cl. 43—15 **2 Claims**



1. The combination of:
a fishing pole including a handled end with reel mounted thereon and an opposite eyelet end, said reel having fishing line wrapped thereon and extending therefrom;
a bracket mounted on said pole;
a catch mounted on said pole between said bracket and said eyelet end of said pole;
a first elongated element pivotally mounted about a first pivot axis on said bracket, said first elongated element having a distal end located between said first pivot axis and said eyelet end of said pole and further having a rearward portion extending between said handled end and said first pivot axis;
a second elongated element pivotally mounted about a second pivot axis to said distal end of said first elongated element and having a bottom hook end engageable with said catch and further having a top end with an open eyelet formed thereon slidably receiving said line, said second elongated element being mounted to said first elongated element intermediate said top end of said second elongated element and said bottom hook end of said second elongated element;
a first helical spring having a bottom end attached to said bracket between said first pivot axis and said handled end and further having a top end attached to said rearward portion of said first elongated element normally urging said rearward portion downwardly and said distal end and said second elongated element upwardly;
a second helical spring with a bottom end attached to said first elongated element between said first pivot axis and said distal end and further having a top end attached to said second elongated element between said second pivot axis and said top end of said second elongated element, said second helical spring normally biasing said bottom hook end against said catch located between said bottom hook end and said eyelet end of said pole but yieldable to allow said second elongated element to pivot about said second pivot axis when said line extending through said eyelet of said second elongated element is pulled by a fish forcing said bottom hook end away from said catch and toward said bracket.

3,889,414

DOLL WITH REMOVABLE WIG

Grace Eva Whetzel, 5549 Langport, No. 1, Long Beach, Calif. 90805

Filed Oct. 31, 1973, Ser. No. 411,476
Int. Cl. A63h *3/44*
U.S. Cl. 46—172 **2 Claims**

1. A rag doll comprising:
a padded head including an outer covering having a pair of fabric sections terminating in opposed margins extending up the sides and across the top of said head, each of said margins being turned under to define a seam allowance, said head further including an elongated tape made of fabric which is of heavy-duty construction highly resistant to tearing as compared to the fabric of said fabric sections, said tape being interposed between said margins with its edges turned under and stitched to said seam allowances to form an integral part of said head;
a wig for covering said head and including an elongated tape made of fabric which is of said heavy-duty construction and arranged in overlying relation to said tape of said head; and
attachment means carried by said tapes and operative to detachably connect said tapes together whereby said wig can be readily attached to and separated from said head without tearing the fabric of said outer covering of said head.

3,889,415

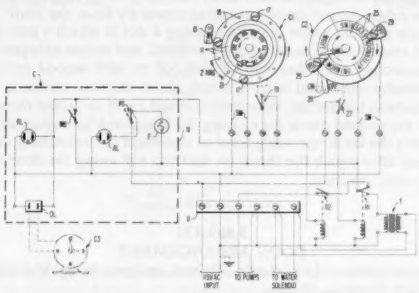
CONTROL SYSTEM FOR PERIODICALLY FEEDING NUTRIENT SOLUTIONS TO HYDROPONIC PLANT BEDS

Floyd W. Holmes, 7302 Rolliston St., Jacksonville, Fla. 32208

Filed Jan. 29, 1974, Ser. No. 437,661
Int. Cl. A01g *31/00*
U.S. Cl. 47—1.2 **8 Claims**

1. In a hydroponic system comprising at least one plant bed and a storage vat means, electric pump means connected between said plant bed and said storage vat means for pumping nutrient solution to said plant bed from said storage vat means, means connected to said vat means for replenishing lost water to said vat means and including a solenoid-operated valve, the improvement comprising: a first clock switch means electrically connected to said pump means for periodically

energizing said pump means, said first clock means being adjustable as to the time and the duration of each pumping cycle, a second clock switch means electrically connected to said first clock switch means and adapted to disable said first clock switch means adjustably between near sunset and near sunrise times, said second clock switch means being further



augmented by means for permitting opening of said solenoid valve only during the time said first clock switch means is disabled by said second clock switch means, whereby said storage vat means is protected against possible overflowing by back drainage from a recently flooded bed into an already full vat means.

3,889,416

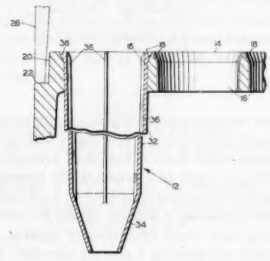
SEEDLING TREE GROWING APPARATUS

Duncan G. Bergeron, Rt. 2, Box 706, Beaverton, Oreg. 97005, and Ray E. Leach, Rt. 2, Box 20, Aurora, Oreg. 97002

Filed Dec. 10, 1973, Ser. No. 423,386

Int. Cl. A01g *9/02;* **A47b** *71/00*

U.S. Cl. 47—34.13 **4 Claims**



1. Seedling tree growing apparatus comprising, in combination:

a. a tray comprising
   1. a horizontally arranged support plate,
   2. a plurality of spaced openings vertically through the plate, and
   3. a plurality of spaced legs extending downwardly from the underside of the plate for supporting the same on a supporting surface, and

b. a plurality of seedling tree growth cells each comprising a tube open at both ends and arranged to removably contain a quantity of tree growth media,

c. the tubes being removably contained one in each of the support plate openings with the bottom ends of the tubes spaced upwardly from the plane of the bottom edges of the legs, whereby the bottom open ends of the tubes are spaced above a supporting surface to afford access of air for air pruning the roots of seedling trees planted in the tubes,

d. the support plate openings being provided with recessed margins and the upper margins of the tubes being provided with outwardly extending circumferential flanges dimensioned to seat in the recesses with the upper surfaces of the tubes and flanges being on a horizontal plane not substantially higher that the horizontal plane of the upper surface of the support plate, and each of the tubes being provided with a plurality of radially spaced, longitudinally extending interior root-guiding ribs.

3,889,417

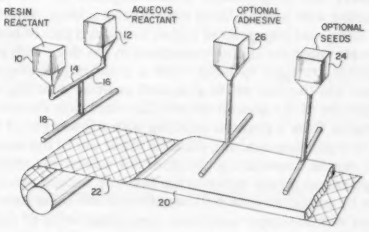
METHOD FOR PREPARING HORTICULTURAL FOAM STRUCTURES

Louis Leonard Wood, Rockville, Md., and Kurt Charles Frisch, Grosse Ile, Mich., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 279,403, Aug. 10, 1972, Pat. No. 3,812,619, which is a continuation-in-part of Ser. No. 250,012, May 3, 1972, abandoned. This application May 16, 1974, Ser. No. 470,492The portion of the term of this patent subsequent to May 28, 1991, has been disclaimed.

Int. Cl. A01g *9/10*

U.S. Cl. 47—58 **21 Claims**



1. A method for preparing improved crosslinked hydrophilic foam structure said method comprising reacting as a continuous sheet, a first component comprising isocyanate capped polyoxyethylene polyol having a reaction functionality greater than two, with a second component comprising aqueous reactant in the presence of a horticultural material, the ratio of moles H_2O/moles NCO groups being about 6.5 to about 390 in said second and first components respectively.

3,889,418

HIGH DENSITY TREATMENT PRODUCT

Kenneth E. Porter, Mesa, and Perry L. Nelson, Phoenix, both of Ariz., assignors to American Bioculture, Inc., Plumsteadville, Pa.

Continuation of Ser. No. 337,395, March 2, 1974, abandoned. This application Apr. 25, 1974, Ser. No. 464,689

Int. Cl. C02c *1/00;* **A01h** *13/00*

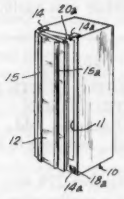
U.S. Cl. 47—58 **10 Claims**

1. A method of producing algal products having properties useful for the treatment of material such as soil and waste water which comprises culturing green algae in an aqueous nutrient medium in the presence of light and carbon dioxide and at a temperature of between about 20°C and about 30°C, harvesting the culture before the end of logarithmic growth after the population density of the cells is at least 10^6 cells per milliliter and applying the harvested culture to the material to be treated.

3,889,419
TWO-WAY OPENING DOOR FOR HOUSEHOLD REFRIGERATOR

Leroy Robert Maleck, Galesburg, Ill., assignor to Admiral Corporation, Chicago, Ill.

Filed Aug. 29, 1973, Ser. No. 392,744
Int. Cl. E05d 15/50
U.S. Cl. 49—193 11 Claims

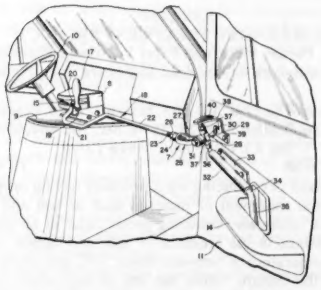


1. In a cabinet for a home appliance having a door mounted for pivotable movement on a set of hinge pins disposed on one side of an opening, and means for holding the door in a position closing the opening, the improvement comprising a first set of hinge pins mounted on the cabinet adjacent one side of the opening, a second set of hinge pins mounted on the cabinet adjacent a second side of the opening opposite said first side, each of said sets of hinge pins includes an upper pin and a lower pin, engagement means disposed on the door for coacting with a set of hinge pins to form a hinge mounting for the door, said engagement means includes a pair of bolt members mounted for sliding movement in the door with one bolt member arranged to move from a position coacting with an upper pin the first set to a second position coacting with an upper pin of the second set and the other bolt member being movable from a position coacting with a lower pin of the first set to a position coacting with the lower pin of the second set, and means disposed on the door for selectively shifting the engagement means between the first and second sets of hinge pins by acting on both bolt members in the same direction to coact with the upper and lower pins respectively of one of the pair of sets so that the hinge mounting of the door can be shifted between the first and second side of the opening to enable the door in either of two directions.

3,889,420
VEHICLE DOOR OPERATOR

Clinton L. Hildebrand, 1139 N. Baltimore, Derby, Kans. 67037

Filed Dec. 19, 1973, Ser. No. 426,350
Int. Cl. E05f 11/22
U.S. Cl. 49—302 6 Claims

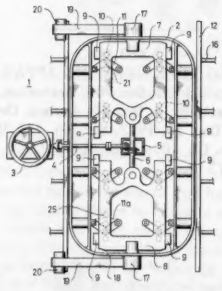


1. A vehicle door operator comprising a lever, means pivotally mounting said lever adjacent one end thereof for swinging movement in a direction crosswise of a vehicle, a rigid rod having one end pivotally connected to said lever at a point spaced from said pivot means, a bearing sleeve mounted on the inner side and crosswise of a passenger access door of the vehicle, a shaft journaled in said sleeve, said shaft having terminal portions forming cranks disposed beyond the ends of said bearing and between the side edges of the door, a first one of said cranks extending downwardly from the shaft and being disposed to engage a door latch actuating lever of said door, the other second crank extending upwardly from the shaft, a guide secured to the door and having a slot in which a part of the second crank is swingably confined, and means swingably connecting the other end of said rod to said second crank whereby when said lever is swung about its pivot means in a direction toward the door said rod will exert an initial thrust on the second crank for causing the first crank to engage and move the latch operating lever to a position for unlatching the door after which the thrust on said rod will swing the door to an open position.

3,889,421
DOOR ARRANGEMENT

Aarre Ahonen, Lahderanta, Finland, assignor to Oy Wartsila AB, Helsinki, Finland

Filed Aug. 28, 1973, Ser. No. 392,342
Claims priority, application Finland, Sept. 1, 1972, 2411/72
Int. Cl.[2] E05C 9/00
U.S. Cl. 49—395 5 Claims

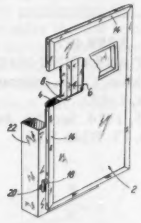


1. A door arrangement comprising a movable door having greater length than width, a stationary wall and a bolt device comprising movable bolts in said door arranged in two groups each forming one half of a substantially symmetrical configuration and bolt receiving members at said wall, said bolt device further including a driving means for moving said bolts and pressing said door hermetically against said wall, said driving means comprising a driving member, a motion transmission system connected to said driving member, and including an axially slightly movable through-going, two-ended secondary shaft, upper and lower slides respectively connected to one of the ends of the shaft, at least one toggle joint mechanism for each slide connected at one end to the door and at the other end to a bolt of the respective group, and axially spaced drive elements on said slides engaging the joint of a respective said toggle joint mechanism for projecting or retracting the associated bolt, one drive element in each pair being on one side of the joint of the associated toggle joint mechanism and the other drive element of the same pair being on the other side of the joint of the associated toggle joint mechanism, each toggle joint mechanism moving to an over-center locked position in going from the retracted to the projected position, stop means on said door for engaging each toggle joint mechanism to limit the over-center movement thereof, and guide means on said door engaging said slides for guiding the same in axial displacement.

3,889,422
WOODEN DOOR BLADES

Jorgen Carsten Nielsen, Ostergade 14, 8620 Kjellerup, Denmark

Filed Feb. 22, 1973, Ser. No. 334,850
Claims priority, application United Kingdom, Feb. 28, 1972, 9014/72
Int. Cl. E06b *3/08*
U.S. Cl. 49—501 **9 Claims**

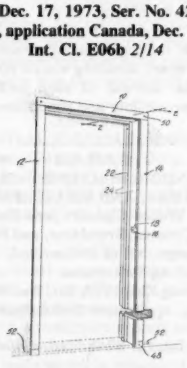


1. A door blade of the insulating builtup type comprising
an internal framework means including a wooden peripheral edge frame, said peripheral edge frame extending peripherally of the door blade, and said peripheral edge frame having a peripheral recess at one side thereof,
at least two panel plate means for covering said internal framework means, each of said two panel plate means secured to opposite sides of said internal framework means, thereby forming opposite surfaces of a door blade, and
reinforcing frame means for reinforcing the resulting structure of said panel plate means covering said internal framework means, said reinforcing frame means being formed of profiled beams of a rigid metal material with said profiled beams being rigidly joined at corners of said reinforcing frame means, said profiled beams having a hollow cross-sectional configuration, and
said profiled beams of said reinforcing frame means being rigidly secured in said peripheral recess of said wooden peripheral edge frame for extending along the periphery of said resulting structure only at one side of said resulting structure such that said reinforcing frame means is spaced from the panel plate means at the opposite side of said resulting structure.

3,889,423
REVERSIBLE DOOR FRAME

Claude Begin, 380 De La Rive, Quebec 2, Province of Quebec, Canada

Filed Dec. 17, 1973, Ser. No. 425,625
Claims priority, application Canada, Dec. 18, 1972, 159253
Int. Cl. E06b *2/14*
U.S. Cl. 49—504 **1 Claim**

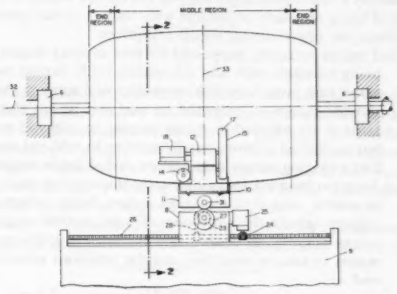


1. A door frame of metal section members of identical shape and dimensions comprising a lintel, a hinge post with provisions for connections of hinges, and a latch post with a latch element therein, said lintel and said posts having matching joint configurations at the ends thereof whereby either end of said posts may be joined to said lintel to define a frame having continuous flush opposed outer surfaces, said lintel and said posts being symmetrical in respect of said hinge connections, said latch and said joint configurations about a central plane perpendicular to the longitudinal extent of said lintel and said posts,
said frame members comprising separate identical wings and a separate door stopper, said wings having grooves at their inner edges, said door stopper having tongues at its outer edges seated in said wing grooves, and resilient snaps holding said tongues in said grooves.

3,889,424
APPARATUS FOR RESURFACING THE CYLINDRICAL FACE OF LARGE DRIER DRUMS

Eric S. Buhayar, Swarthmore, Del., and Gordon F. Gerstenkorn, Springfield, Pa., assignors to Scott Paper Company, Philadelphia, Pa.

Continuation of Ser. No. 179,691, Sept. 13, 1971, abandoned.
This application May 20, 1974, Ser. No. 469,738
Int. Cl. B24b *5/16, 51/00*
U.S. Cl. 51—49 **9 Claims**

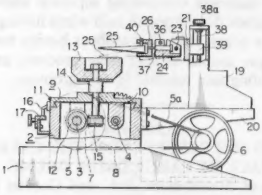


1. Apparatus for forming predetermined complex crown contours on the exterior surface of a large creping and drier drum, whereon the contour of the end regions differs from the contour of the middle region of the drum, comprising:
a carriage;
means for traversing said carriage from end to end of said drier drum;
grinder means rotatable on its axis for forming said crown contours, said grinder means being movably mounted on said carriage and spaced from the axis of said drier drum, said grinder means having an abrasive surface on which the center of the area of contact of the abrasive surface and the drum surface varies across the width of the abrasive surface for different traverse positions of said carriage and the center point of the abrasive surface periphery is spaced from the exterior surface of the drum by distance which varies for different traverse positions of said carriage; and
cam means for causing movement of said grinder means with respect to said carriage to vary said spacing between said grinder means and said axis of said drier drum, said cam means including a cam contoured in a predetermined relationship to the predetermined crown contours to be formed on the end regions and the middle region of the surface of said drier drum and contoured to compensate for the change in distance between the center point of the abrasive surface periphery and the exterior surface of the drum resulting from the contour of the exterior surface of the drum.

3,889,425
MICROTOME KNIFE SHARPENING MACHINE

Naomichi Miyamoto, 75-5, Oaza-Imojiya, Koshoku-shi, Nagano-ken, Japan

Filed Aug. 14, 1974, Ser. No. 497,502
Claims priority, application Japan, Aug. 15, 1973, 48-95876; Aug. 15, 1973, 48-95877
Int. Cl. B24b 7/00, 9/00
U.S. Cl. 51—56 8 Claims



1. In a microtome knife sharpening machine comprising a base structure, a grinding wheel rotatable about an axis and having a planar grinding surface, means for driving said grinding wheel in rotation, microtome knife carrier means, and support means mounted on said base structure to be swingable about a pivot axis and supporting said knife carrier means, whereby a microtome knife held by the carrier means is capable of being angularly adjustable with respect to said grinding surface, the improvement which comprises:

rod means rotatably supported by said support means and being rotatable with said microtome knife carrier means about said pivot axis with respect to said support means;

slidable means so mounted on said rod means that the same is not allowed to rotate relative to said rod means but is allowed to move axially relative to said rod means;

first engaging means disposed on said slidable means;

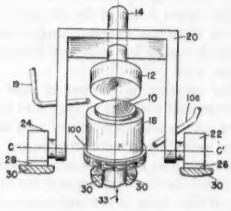
at least two second engaging means disposed on said base structure, said first engaging means being adapted to engage selectively with one of said second engaging means thereby to enable said microtome knife carrier means to take at least two angular positions selectively; and

resilient means urging said slidable means and hence said first engaging means toward said second engaging means thereby to provide a tendency of said first engaging means to move into engagement with said second engaging means.

3,889,426
OPTICAL LENS GENERATING MACHINE HAVING AN AIR ROTATABLE SPHERICAL BEARING WORKPIECE HOLDER

Raymond T. Blum, Pittsford, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Jan. 7, 1974, Ser. No. 431,536
Int. Cl. B24b 9/14, 7/00
U.S. Cl. 51—55 5 Claims



1. An optical lens surfacing machine for operation upon a refractive surface of an optical lens material, comprising:

an optical lens surface operation tool for operating upon the refractive surface of the lens material;

means for rotatably carrying said operation tool about an axis of rotation;

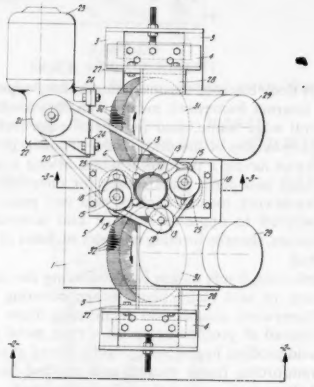
support means for carrying the lens material in relatively free rotation about an optical axis of the lens material; and

pneumatic system means for applying a rotation force to said support means for a predetermined duration.

3,889,427
METAL CUP ABRADING MACHINE

Thomas A. McCoy, Stockton, Calif., assignor to Carando Machine Works, Stockton, Calif.

Filed Apr. 25, 1974, Ser. No. 464,117
Int. Cl. B24b 5/38
U.S. Cl. 51—80 A 9 Claims



9. A machine—adapted for use in the manufacture of sheet metal cans—operative to prepare, by abrading, the exterior of the circumferential sidewall of pre-formed sheet metal cups for the reception and retention of a lubricant as requisite to proper die-forming of such cups into a can configuration; said machine comprising—on a supporting structure—a guideway arranged to guide the cups for movement through a predetermined abrading zone, power-driven means to so move the cups, and power means operative to abrade the circumferential sidewall of each individual cup as moved through such abrading zone; the cup-moving means comprising a pair of driven, spaced-apart, friction rollers positioned to engage opposite sides of the circumferential sidewall of each such individual cup; and the cup-abrading means comprising a pair of driven, spaced-apart, abrading wheels positioned to engage the circumferential sidewall of each such cup at opposite points thereon intermediate and simultaneously with the rollers.

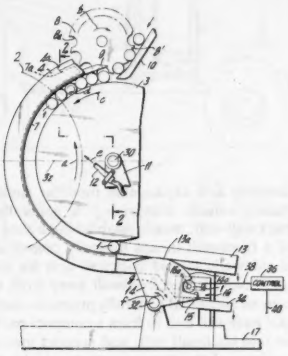
3,889,428
SURFACE GRINDING MACHINE INCLUDING WORK FEED, DELIVERY, AND MEASUREMENT MEANS

Hans Steinegger; Walter Glauser; Jean-Pierre Rossier, all of Morges; Rene Crausaz, Bremblens, and Pierre Andere Matthey-Doret, Morges, all of Switzerland, assignors to Establissments Sim S.A., Switzerland

Filed Aug. 24, 1973, Ser. No. 391,131
Claims priority, application Switzerland, Aug. 28, 1972, 12670/72
Int. Cl. B24b 7/16, 49/04
U.S. Cl. 51—112 6 Claims

1. A surface grinding machine particularly for grinding workpieces having surfaces of revolution, for example rollers, comprising a guide disk having a curved peripheral surface

over which the workpieces are moved, a stationary ring overlying at least a portion of said curved spherical surface and spaced therefrom by an amount to define a workpiece operational path to accommodate the workpieces therebetween, the respective opposite ends of said ring defining an inlet and an outlet with said guide disk at the respective ends, means for feeding workpieces into the space between said ring and said guide disk peripheral surface at said inlet of said ring segment, a cylindrical grinding disk on each side of said guide disk having a periphery overlapping the periphery of said guide disk on respective sides thereof so as to be in a position to contact and grind the end surfaces of the workpieces moving over the peripheral surface of said guide disk along said operational path, delivery means at said outlet end of said ring for feeding said workpieces out of said operational path, an elastic



pressure element held by said ring segment and adapted to bear inwardly against the workpieces, said delivery means including a member engaging each workpiece in succession, and measuring means adjacent said delivery means for measuring the width of the workpiece, said grinding disk being movable toward and away from each other to change the spacing therebetween in accordance with the measurement obtained by said measuring means, said delivery means including an oscillatable segment member having an outer curved surface with a recess adjacent one end of a size to accommodate a workpiece, a delivery trough connected to said operational path and having an opening therein for a workpiece overlying the curved surface of said segment, said segment being oscillatable to periodically present the recess therein below the opening in said trough to receive a workpiece and being oscillatable in a reverse direction to present the workpiece at a delivery station, said measuring means being located at said delivery station, said measuring means comprising a feeler arm on each side of the workpiece engageable with said workpiece and holding it in the recess until it is measured.

3,889,429

RESIDUE REMOVAL SYSTEM FOR BELT ABRADER

Warren H. Zuercher, Cottage Grove, Oreg., assignor to Kimwood Corporation, Cottage Grove, Oreg.

Filed Nov. 1, 1973, Ser. No. 411,915

Int. Cl. B24b *21/18, 55/06*

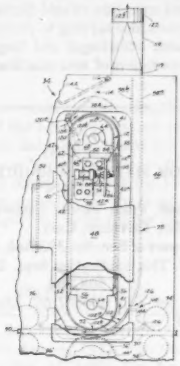
U.S. Cl. 51—135 R **6 Claims**

2. In combination with a flexible belt abrader including an endless belt with an abrasive material-removing outer face and roll support for such belt comprising a pair of spaced rolls having the belt trained thereover,

means for guiding a workpiece against said belt in a zone where such is supported by one of said rolls with the belt curving about said one roll in regions on opposite sides of said zone,

power drive means for rotating the roll support for the belt whereby the belt travels from said zone about the curvature of said one roll and thence toward the other of said rolls in an outgoing reach of the belt,

residue removal ductwork comprising an elongate duct expanse including a wall portion extending the length of said outgoing reach in spaced opposition to the outer face of the belt in said reach, and duct wall structure extending between the lateral margins of said duct expanse and adjacent margins of said belt where it extends in said outgoing reach and including a wall portion facing the rear of said belt where it extends in said outgoing reach, whereby a substantially enclosed elongate course is defined which parallels and includes said reach of the belt, said residue removal ductwork having an opening for air to travel into said course adjacent said zone and another opening in a region adjacent said other roll to accommodate additional flow of air into the ductwork, said ductwork further including an adjustable baffle which controls the size of said other opening, and



air mover means for producing a current of air through said course with such air moving in the direction of belt travel.

3,889,430

ABRASIVE TOOLS

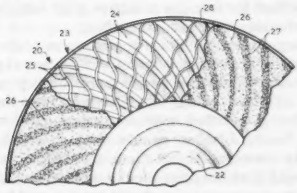
Lazare Scandaletos, Paris, France, assignor to S.P.A.M., Ville D'Avray, France

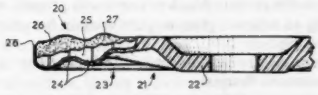
Filed May 16, 1973, Ser. No. 360,802

Claims priority, application France, May 17, 1972, 72.17665; May 8, 1973, 73.16577

Int. Cl. B24d *5/04, 5/14, 7/04*

U.S. Cl. 51—206 NF **15 Claims**





1. In an abrasive tool adapted to be mounted endwise of the shaft of a grinding machine rotatable at a high speed which tool includes a central support section of discoidal shape adapted to be centered upon and secured to said shaft and a

peripheral section carrying on one of the side faces thereof a coating of abrasive granular material bonded by an adhesive presenting a generally radially extending working surface, the improvement comprising said peripheral section of said support being a relatively thin radially extending web having a thickness in the axial direction substantially less than that of said central support section, the region between said web and said central support section defined by the thickness difference of said web and support being covered by said coating of abrasive material, at least a portion of said surface of said web having undulations of amplitude greater than the thickness of said web to provide an increase in surface area, and anchoring faces for increased retention of said coating of abrasive material, said undulations also serving to provide reinforcement of said coating against centrifugal and tangential forces which develop during operation of said machine.

3,889,431

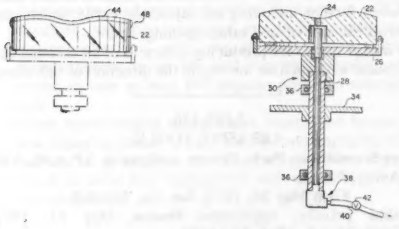
METHOD FOR MAKING SCHMIDT CORRECTOR LENSES

Thomas J. Johnson, Palos Verdes Estates, Calif., assignor to Celestron Pacific, Torrance, Calif.

Continuation-in-part of Ser. No. 393,846, Sept. 24, 1974, Pat. No. 3,837,125. This application Sept. 23, 1974, Ser. No. 508,794

Int. Cl.[2] B24B *1/00, 13/00*

U.S. Cl. 51—284 **5 Claims**



1. A method for forming a master glass template used in making Schmidt correctors, comprising:

A. cutting a thin test piece of glass so as to form shallow grooves in the surface thereof in a cartwheel pattern;

B. mounting said test piece upon a previously ground master glass template contour block having a bore therethrough and being mounted upon a grinding machine backing plate having a hollow spindle through which a vacuum may be drawn, such that the test piece grooves interface with said glass template block and intersect said bore;

C. drawing a vacuum through said grooves and between said block and test piece, so as to deform the test piece to the curve on the contour block as previously ground, vacuum forming an intimate glass-to-glass contact between block and test piece;

D. grinding the exposed surface of the test piece to a uniform accurate flatness;

E. removing and testing the test piece for accuracy of the desired inverse curve of the block;

F. marking excess glass on said test piece; and

G. further grinding and polishing said testpiece so as to remove residual errors in the contour surface thereof.

3,889,432

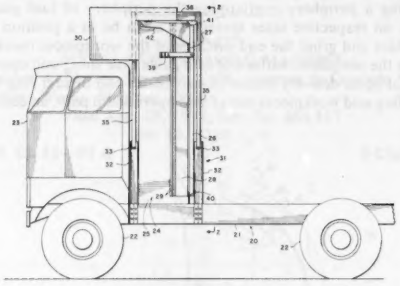
FOLDABLE MODULAR SHELTER UNIT REMOVABLY SECURED TO A VEHICLE

Jerry L. Geihl, 4606 Cedar Springs Rd., Dallas, Tex. 75219

Division of Ser. No. 283,829, Aug. 25, 1972, Pat. No. 3,827,198. This application Dec. 26, 1973, Ser. No. 427,444

Int. Cl. E04h *1/12;* **B60p** *3/34*

U.S. Cl. 52—69 **6 Claims**



1. A foldable and expandable modular shelter unit for a transportation vehicle comprising: a generally rectangular upright backwall unit; means establishing a roof, a floor, sidewalls and a frontwall; means hingedly connecting said roof, floor and sidewalls to said backwall unit for displacing said roof, floor, sidewalls and frontwall away from said backwall unit to form an expanded generally prismatic shelter room and toward said backwall unit to form a compact package; support means for said backwall unit, said support means comprising frame members of the transportation vehicle; means for releasably securing said backwall unit to said support means; linkage means connected at one end to said support means and at an opposite end to a top section of said backwall unit; and expansion means connected to said linkage means for raising said backwall unit upwardly from said support means, outwardly therefrom and downwardly upon a ground surface adjacent to the transportation vehicle.

3,889,433

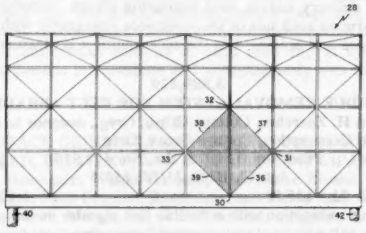
STRUCTURAL FRAME

Joseph P. Eubank, Jr., P.O. Box 582, 44 Laurel View Ave., Inverness, Calif. 94937

Filed July 5, 1974, Ser. No. 485,813

Int. Cl. E04b *1/32*

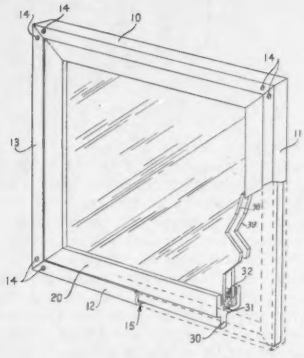
U.S. Cl. 52—86 **13 Claims**



1. A structural frame of an extended generally arcuate configuration comprising a plurality of frame units joined together in repeating arrangement and comprised of first strut means for taking compression forces along a pair of perpendicular axes in a plane, second strut means for taking compression forces along an axis perpendicular to said plane of said first strut means, said second strut means being spaced

from one of said axes of said first strut means and intersecting the other axis of said first strut means whereby said other axis extends between said second strut means axis and said one axis of said first strut means, and means connected in tension between end portions of said second strut means and end portions of said first strut means at said one axis thereof for taking the tensile forces of said unit.

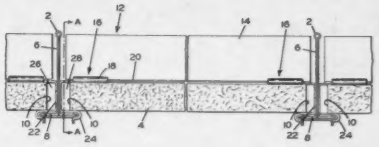
3,889,434
THERMAL GLASS STRUCTURAL DEVICE
Lyle N. Shelver, 5020 Ambrose Dr., Reno, Nev. 89502
Filed Apr. 12, 1974, Ser. No. 460,277
Int. Cl. E06b *3/28*
U.S. Cl. 52—172 **4 Claims**



1. The combination with a frame for holding a single pane of glass of: An adaptive element comprising an elongated base member having an elongated rail depending from one side thereof and perpendicular to the plane thereof, said rail being inserted in said frame in lieu of glass, a pair of elongated guides — one adjacent each edge of said base — depending from said base in the opposite direction from said rail and at a perpendicular relationship to the base, said guides being provided with serrations on their surfaces facing one another, and a pair of L-shaped projections depending from said base in the same direction as said side members, with the bases of said L-shaped members facing one another in a mirror image of such manner as to form a T-shaped cavity intermediate said members; mastic material partially filling the space between said side members; two panes of glass within said side members, one side of each pane of glass being adjacent the said serrations, the other sides of said panes of glass being at a spaced relationship from one another; an elongated hollow member containing a desicant extending the length of said panes of glass and adjacent their edges in contact with said mastic.

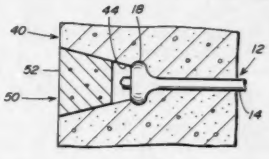
3,889,435
HOLD-DOWN STRUCTURE FOR ACCESSIBLE CEILING PANEL ASSEMBLY
James C. Ollinger, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.
Filed Oct. 26, 1973, Ser. No. 409,817
Int. Cl. E04b *5/54*
U.S. Cl. 52—489 **4 Claims**

1. A suspended ceiling system wherein there is provided at least two main runner structures of inverted T shape having a web portion and a horizontal flange portion, a ceiling panel resting upon the horizontal flanges of two adjacent main runner structures, said ceiling panel having a front side, a back side and four ends, the improvement comprising a hold-down means positioned on the back side of the ceiling panel opposite from the front side of the ceiling panel resting upon the horizontal flanges of the main runner structures, said hold-down means not providing support to the ceiling panel ends, said hold-down means having clips on the ends thereof and being locked to the main runner structures to secure the hold-down means from movement so that the ceiling panel is held in position against the horizontal flanges of the main



runner structures, and means of releasing the locking relationship of the clips of the holddown means to the main runner structures so that the hold-down means and ceiling panel may be removed from the horizontal flanges of the main runner structures, and said means releasing the locking relationship being actuated from a position on the front side of the ceiling panel which rests upon the main runner horizontal flanges.

3,889,436
FINISHING PLUG
James Madison Elliott, 3509 Matador, Garland, Tex. 75042
Division of Ser. No. 365,711, May 31, 1973, which is a division of Ser. No. 264,013, June 6, 1972, Pat. No. 3,827,208. This application Oct. 21, 1974, Ser. No. 516,593
Int. Cl. E04g *23/02*
U.S. Cl. 52—514 **1 Claim**

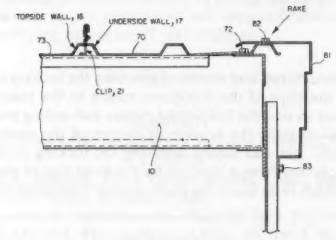


1. In combination:
a concrete wall of the type formed by positioning assemblies including tie rods having opposed shoulders and plastic cones mounted on the opposite sides of the shoulders between forms with the plastic cones engaging the forms and the shoulders of the tie rods to maintain a spaced relationship between the forms, pouring concrete into the space between the forms, setting the concrete to form a wall, and then removing the forms and the plastic cones to expose at least one wall surface having a plurality of conical holes therein each corresponding to a removed plastic cone;
each of said conical holes in the exposed wall surface having a predetermined diameter at the wall surface, a predetermined conical taper and a predetermined depth; and
a plurality of precast concrete plugs each filling one of the conical holes in the wall surface to provide an entirely flush exposed wall surface of the concrete wall;
each of said precast concrete plugs having a flat circular end surface positioned flush with the exposed wall surface of the concrete wall and being substantially equal in diameter to the diameter of the conical holes in the wall at the wall surface, having a conical taper substantially equal to the conical taper of the conical holes in the wall, and being substantially shorter than the conical holes in the wall and thereby accommodating tie rod portions extending beyond the shoulders into the conical holes in the wall.

3,889,437
METAL ROOF

Donald L. Day, Guysville, Ohio; Charles H. Halstead, Poca, W. Va., and Neil F. Huck, Lowell, Ohio, assignors to Textron Inc., Providence, R.I.

Division of Ser. No. 313,754, Dec. 11, 1972. This application July 17, 1974, Ser. No. 489,135
Int. Cl.[2] E04D *1/00*
U.S. Cl. 52—520 10 Claims



1. A standing seam connecting an adjacent pair of panels together, the seam being formed by interfitting topside and underside walls on the respective panels,

the first panel including an underside wall having:

a. an underside rib to be disposed adjacent to the support structure for the roof;

b. an underside leg connected to and extending upwardly from the underside rib;

c. an underside lower V-flange connected to the underside leg and extending outwardly at an oblique angle thereto;

d. an underside upper V-flange connected to the underside lower V-flange and extending outwardly and over the underside lower V-flange at an acute angle thereto;

e. an underside sealing flange having a riser section connected to the underside upper V-flange and extending upwardly therefrom and also having a crimping section connected to the riser section and extending outwardly at an acute angle thereto;

the second panel including a topside wall having:

a. a topside rib to be disposed adjacent to the supporting structure for the roof;

b. a topside leg connected to and extending upwardly from the rib and generally parallel to and substantially engaged with the underside leg;

c. a topside lower V-flange connected to the topside leg and extending outwardly at an oblique angle thereto and being substantially engaged with the underside lower V-flange;

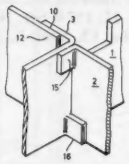
d. a topside upper V-flange connected to the topside lower V-flange and extending outwardly and over the topside lower V-flange and at an acute angle thereto and being substantially engaged with the underside upper V-flange;

e. a topside sealing flange having a riser section connected to the topside upper V-flange and extending upwardly therefrom and being in substantial engagement with the underside riser section and also having a crimping section bent back on and in substantial firm engagement with the underside crimping section, the riser section and crimping section of the topside sealing flange forming a cover over the underside sealing flange and thereby sealing the seam against entry of water.

3,889,438
LATTICE CONSTRUCTION

Gijsbrecht Gerhardus Piepers, Heiloo, and Christiaan Gustaaf Adolf Scholtus, Alkmaar, both of Netherlands, assignors to Reactor Centrum Nederland, The Hague, Netherlands

Filed Mar. 27, 1972, Ser. No. 238,286
Claims priority, application Netherlands, Mar. 26, 1971, 7104076
Int. Cl. E04c *2/42*
U.S. Cl. 52—668 7 Claims

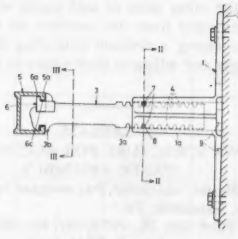


1. A lattice, specially adapted to support a bunch of elongated components participating in a heat-exchange process, wherein said lattice comprises comb-like strips which form compartments surrounded by intersecting strips, said strips having comb-like incisions adapted to engage said strips in an intersecting manner, wherein the edges of said strips are provided on both sides with fixing lips which are bent into the plane of the lattice and are also stamped out of the edge of the strip, wherein at each incision of each strip of the lattice there is a first lip on the same edge as the incision and a second lip on the edge opposite said incision, and at each intersection of the strips said second lip of one strip extends through the incision of a second intersecting strip and is secured to said intersecting strip on the side opposite the position at which said first lip is secured.

3,889,439
DEVICE FOR HOLDING FRONT WALL OR INSIDE WALL FACINGS AS WELL AS INSIDE OR OUTSIDE FACINGS OF A CEILING IN A PRE-SET DISTANCE FROM A SUPPORTING WALL RESPECTIVELY A CEILING

Hans Kaspar, Beinwil am See, Switzerland, assignor to Neomat AG, Switzerland

Filed June 27, 1974, Ser. No. 483,895
Claims priority, application Switzerland, June 29, 1973, 9569/73
Int. Cl. E04b *1/38*
U.S. Cl. 52—709 5 Claims



1. In a device for holding front or inside wall facings at a pre-set distance from a supporting wall, or for holding inside or outside facings of a ceiling at a pre-set distance from the ceiling, and of the type including a bracket fastened ot the supporting wall or the ceiling, the improvement comprising, in combination, a tube-like receiving member forming part of said bracket and arranged to extend perpendicularly outwardly from the supporting wall or ceiling on which said

bracket is fastened; a compensating element having an inserting neck at one end and a bearer head at its opposite end, said inserting neck being constructed for insertion into said tube-like receiving member; said inserting neck having grooves on a pair of opposite sides thereof cooperable with means for anchoring the inserting neck in said tube-like receiving member; a U-shaped girder formed with parallel flanges having inturned lips at their outer ends; said bearer head having at least one groove therein cooperable with an inturned lip; and a wedge-like clamping bolt engageable in a groove of the bearing head and formed with a holding leg engaging the inner surface of an inturned lip of said U-shaped girder.

3,889,440

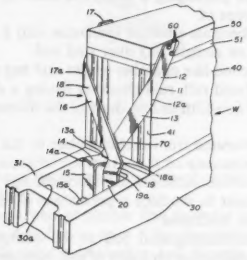
SILL ANCHORING MEANS

Melville B. Sutter, One Cromwell Ter., Akron, Ohio 44313

Filed Mar. 7, 1974, Ser. No. 448,813

Int. Cl. E04b *1/41*

U.S. Cl. 52—714 **6 Claims**



1. Anchoring means for securing sill plates to a brick, concrete block, or masonry wall structure comprising;

A. a first elongate rigid strap having first and second end portions;

B. a second elongate rigid strap having first and second end portions;

C. said first and second straps being immovably secured to each other in overlapping fashion intermediate their ends to form an anchoring means that is X-shaped in elevation;

D. means for securing said first end portions of said straps to the edges of the sill plate; and

E. means for securing said second end portions to the wall structure.

3,889,441

MUDSILL TIEDOWN

Eugene A. Fortine, San Leandro, Calif., assignor to Simpson Manufacturing Co., Inc., San Leandro, Calif.

Filed Apr. 22, 1974, Ser. No. 462,809

Int. Cl.[2] E04B *1/41*

U.S. Cl. 52—715 **8 Claims**

1. A mudsill tiedown for anchorage in a concrete foundation comprising:

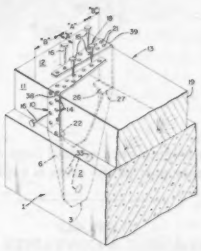
a. an integral web member having a face presented at right angles to the longitudinal axis of the mud sill tapering to a blunt pointed leading edge for embedment in said concrete foundation and presenting outer first and second diverging edges;

b. a first embedded side for embedment in said concrete foundation and integrally and angularly connected to said first edge of said web extending from adjacent said leading edge along substantially said entire diverging first web edge and having a width tapering in dimension toward said pointed edge of said web;

c. a second embedded side for embedment in said concrete foundation and integrally and angularly connected to said second edge of said web extending from adjacent said leading edge along substantially said entire diverging second web edge and having a width tapering in dimension toward said pointed edge of said web;

d. said first and second sides being in spaced diverging relation to one another:

e. a first tie member disposed at right angles to said web member and extending from said first side a distance adapted for engaging the side and a substantial portion of the top face of said mudsill in a flat face to face relationship and being formed with a plurality of spaced apertures adapted for receiving nails or other fasteners therethrough, said tie member being constructed from a malleable material to permit bending of said tie around said side edges of said mudsill;



f. a second tie member disposed at right angles to said web member and extending from said second side a distance adapted for engaging the other side and a substantial portion of the top face of said mudsill in a flat face to face relationship and being formed with a plurality of spaced apertures adapted for receiving nails or other fasteners therethrough, said tie member being constructed from a malleable material to permit bending of said tie around said other side edges of said mudsill; and

g. said web member having a width at its upper end substantially greater than the widths of said tie members and a length equal to a substantial portion of the length of said device which is embedded in said foundation for joining said two embedded sides for a substantial portion of their respective lengths.

3,889,442

METHOD OF AND DEVICE FOR REMOVING A SHRINKABLE PLASTIC WRAPPING FROM A NUMBER OF UNITS, E.G. BOTTLES, FORMING A SUBSTANTIALLY PARALLELEPIPEDICAL BODY

Per Herbert Grahn, Hoganas, and Karl Gustav Eugen Hakansson, Odakra, both of Sweden, assignors to Aktiebolaget Platmanufaktur, Malmo, Sweden

Filed Mar. 7, 1973, Ser. No. 338,819

Claims priority, application Sweden, Mar. 13, 1972, 3154/72

Int. Cl. B65b *43/38*

U.S. Cl. 53—3 **11 Claims**

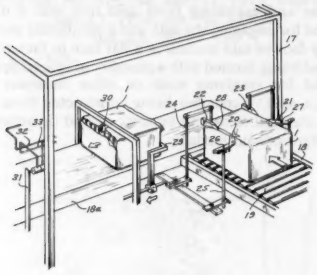
1. A method of partly removing a wrapping of shrinkable plastics material shrunk about a plurality of units arranged in the form of a substantially rectangular package, said method comprising the steps of:

first making intermediate the top wall and the bottom wall of the wrapping in each of two opposite side walls a horizontal first cut extending the entire length of the respective two side walls and parallel to the top and bottom wall of the wrapping;

then making along each of the four corners of the wrapping a second cut extending from the top of each corner to the horizontal cuts in the side walls; and

finally making a third cut across the top wall about midway between the other two uncut side walls and continued to said side wall cuts crosswise thereto thereby dividing the

top wall of the wrapping into two flaps each continued by a portion of said two opposite side walls and a wall portion of the side wall from which it extends;



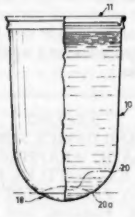
whereby upon folding back of said flaps and said wall portions the upper part of the units is exposed.

3,889,443

METHOD OF FORMING A CONTAINER WITH LID FOR LIQUIDS, ESPECIALLY CARBONIZED BEVERAGES

Uno Wingårdh, Morarp, Sweden, assignor to Sprinter Pack AB, Laholmsvagen, Halmstad, Sweden

Division of Ser. No. 73,298, Sept. 18, 1970, Pat. No. 3,717,274. This application Oct. 24, 1972, Ser. No. 299,873
Claims priority, application Sweden, Sept. 30, 1969, 13453/69
Int. Cl. B65d *23/00*; **B65b** *3/02, 61/00*
U.S. Cl. 53—14 **2 Claims**



1. A method for forming a container for carbonated beverages comprising the steps of:

molding a plastic sheet to form a thin-walled conically tapered continuous side wall open at its upper widened end;

forming a thin-walled hemispherical shaped closure portion integrally joined to the narrow lower end of said side wall to define a convex exterior bottom end;

forming a ring-shaped deformation in said hemispherical shaped bottom portion which surrounds the central portion of said hemispherical shaped closure portion to serve as a surface for supporting said container during either filling or use;

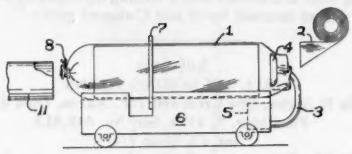
the thickness of said central portion being selected to enable said central portion to be pressed inwardly to form a concave exterior surface surrounded by said ring-shaped deformation and to be pressed outwardly when filled to collectively define said convex bottom end with the remaining portion of the hemispherical shaped closure portion surrounding said ring shaped deformation.

3,889,444

METHOD FOR PACKAGING FIBER GLASS INSULATION

Frank H. Davis, Bethel Park, Pa.; Homer O. Wolfe, Jr., Shelby, N.C., and Billy D. Clapp, Shelbyville, Ind., assignors to Certain-teed Products Corporation, Valley Forge, Pa.

Continuation of Ser. No. 322,658, Jan. 11, 1973, abandoned. This application Apr. 8, 1974, Ser. No. 463,650
Int. Cl. B65b *63/02*
U.S. Cl. 53—24 **4 Claims**



1. A method of packaging a fiberglass sheet of insulation comprising the steps of

a. forming a fiberglass sheet of insulation into a spiral roll,

b. positioning an airtight bag over said roll.

c. providing a cone-like chamber within said bag against the open end of said roll, said chamber having a diameter in the range of one-fifth to one-third of the diameter of said roll,

d. applying a vacuum from said chamber to the interior of said roll, to evacuate air therefrom to compress said spiral layer of insulation sufficient to reduce the size of said roll and insufficient to produce a permanent deformation in the insulation thickness

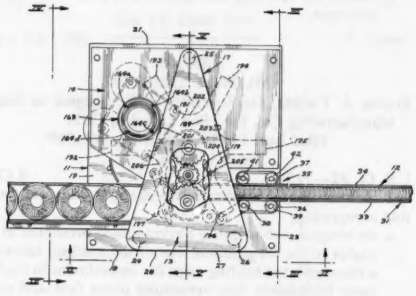
e. and then restraining said roll at the compressed size whereby the thickness recovery of said restrained sheet of insulation is substantially equal to the thickness recovery of a standard non vacuum packaged roll of a sheet of insulation.

3,889,445

WAGON WHEEL PACKAGE LOADER

Douglas J. Brash, Minneapolis, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Filed June 3, 1974, Ser. No. 475,378
Int. Cl. B65b *35/44*
U.S. Cl. 53—26 **10 Claims**



10. A method for packaging chip-type snacks in a loop array package, said method comprising:

nesting uniformly shaped chips to form a column of chips;

moving said column of chips into a loop array;

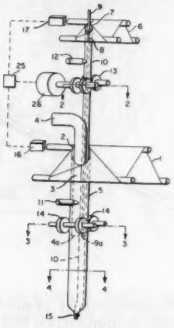
sequentially separating the loop array into a plurality of loop array segments; and

sequentially inserting said segments into a container to form a loop array in said package.

3,889,446
PROCESS FOR FORMING PARTITIONED FILM PACKAGES AND APPARATUS FOR USE THEREIN

Walter John Simmons, Martinsburg, and Frank Marsden Willis, Hedgeville, both of W. Va., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed June 18, 1974, Ser. No. 480,410
Int. Cl. B65b *9/12*
U.S. Cl. 53—28 11 Claims



1. A process for forming a series of partitioned film packages comprising:

a. drawing a web of pliable film material into a cylindrical forming member so as to bring the web's edges together in overlapping relationship and thereby form said web into a tube, and advancing said tube through and past said forming member;

b. feeding a layer of pliable film material through said forming member and advancing said layer within said advancing tube at a rate substantially equal to the rate of advancement of said tube;

c. bringing said advancing tube into a confronting relationship with sealing means adapted to produce a seal between facing surface zones of said web adjacent the overlapping edges thereof in a manner such as to form, as the tube advances, a continuous linear juncture adjacent the edges of said web substantially parallel to the longitudinal axis of said tube;

d. discharging two streams of fluent material into said advancing tube on opposite sides of said advancing layer of pliable film material, the material discharged on one side of said layer being different in composition from that discharged on the other;

e. bringing the filled portion of said advancing tube into periodic engagement with constricting and sealing means which constricts said tube around said layer of pliable film material at spaced intervals and applies a pair of successive encircling closure means to said tube in each constricted area; and

f. severing said tube in the constricted areas between each pair of closure means.

3,889,447
QUALITY CONTROL MONITOR FOR MEDICINAL CAPSULE PACKAGING APPARATUS

Charles R. Garris, Stratford, N.J., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 363,346, May 24, 1973. This application June 7, 1974, Ser. No. 477,195
Int. Cl. B65b *57/00*
U.S. Cl. 53—53 3 Claims

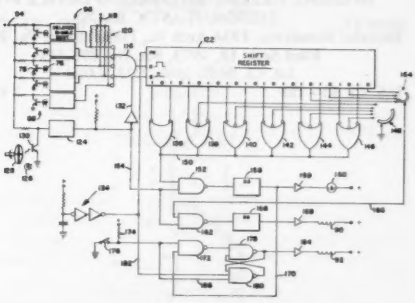
1. A medicinal capsule packaging apparatus comprising:

means normally transporting packaged groups of capsules to a delivery location,

means for inspecting the capsules in said groups and producing a signal as a group passes the inspecting means if the capsules in the group do not meet predetermined criteria,

means, located between said inspecting means and said delivery location, and actuable by a signal to divert groups of capsules from said transporting means to a reject location,

a multiple-state shift register connected to receive signals produced by said inspecting means and delivering said signals after a predetermined delay to said diverting



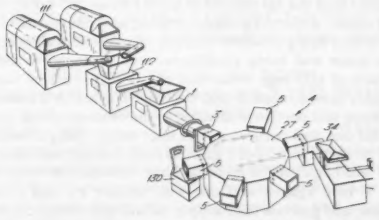
means, whereby the actuation of the diverting means is delayed for a time sufficient to allow a group of capsules which does not meet the predetermined criteria to travel from the location of the inspecting means to the location of the diverting means before the diverting means is actuated, so that acceptable groups of capsules can immediately precede an unacceptable group without being diverted and

means responsive to a predetermined set of conditions in the stages of said shift register for effecting halting of the operation of the packaging apparatus.

3,889,448
APPARATUS FOR PACKAGING EXTRUDABLE MATERIAL

Ronald William Russell, Palmerson North, New Zealand, assignor to New Zealand Dairy Research Institute and New Zealand Dairy Board, both of Wellington, New Zealand

Filed May 23, 1973, Ser. No. 363,101
Claims priority, application New Zealand, May 23, 1972, 167261
Int. Cl. B65b *3/08*
U.S. Cl. 53—122 12 Claims



1. Packaging apparatus for bulk extrudable material comprising an extruding apparatus adapted to extrude a bar of extrudable material to be packaged, molding means comprising a series of molds adapted, in use, to be presented to the extruding apparatus in sequence so that the bar of material is extruded into each mold in turn as the mold is presented to the

extruding apparatus, a cut-off knife adapted to cut off a block of the material being packaged from the bar, indexing means adapted to index movement of the molds so that when a mold has been filled with material, the mold will be moved to a next station where the article to be packaged is covered with a covering selected from an envelope, bag or tube, and ejecting means at a next station adapted to eject the covered block of material from the mold for sealing of the cover about the article.

3,889,449

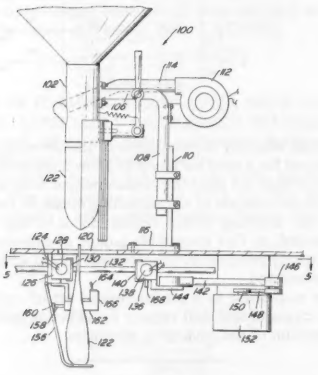
OPENING, FILLING AND SEALING DEVICE FOR THERMOPLASTIC BAGS

Hercules Membrino, 1934 Arch St., Philadelphia, Pa. 19103

Filed Sept. 10, 1973, Ser. No. 395,542

Int. Cl. B65b *1/06, 7/02, 43/33*

U.S. Cl. 53—189 **7 Claims**



1. A filling device for open-mouthed bags having a lip defining a portion of the mouth and an extending rear wall portion which extends beyond said lip, said device comprising a hollow chute having an inlet end and an outlet end, and having a predetermined cross-sectional contour, a bag support means connected to one wall portion of said chute adjacent the outlet end thereof and extending laterally outward from said one wall portion, said bag support means being constructed and arranged to support at least one of said open-mouthed bags, adjacent the extending rear wall portion thereof, in such a manner that the lip thereof is spaced from said outlet end of said chute, a clamping means outside said chute, said clamping means being movable laterally of said one wall portion of said chute and being constructed and arranged to clamp a portion of said bag, while said bag is supported by said bag support means, against said one wall portion in a manner to conform said portion of said bag to the cross-sectional contour of said one wall portion, a fluid inlet means being constructed and arranged to propel a gaseous fluid through said chute and into said bag over the lip of said bag while said portion of said bag is held against said one wall portion by said clamping means, and gaseous fluid supply means operatively connected to said fluid inlet means, said fluid inlet means comprising a channel in a second wall portion of said chute, said channel having an inlet portion connected to a conduit means extending into said second wall portion of said chute and an outlet extending laterally from said channel through a corresponding aperture in said second wall portion, said conduit means being connected to said gaseous fluid supply means.

3,889,450

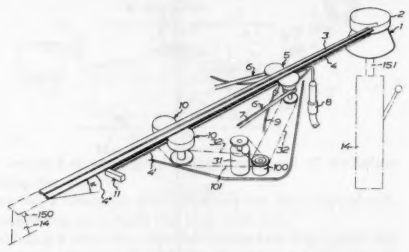
METHODS AND APPARATUSES FOR MAKING STRIPS OF NAILS FOR USE IN NAIL DRIVING TOOLS

Claes Otto Sigfrid Danielson, Malmo; Claes-Göran Staffan Andersson, Raa, and Hans-Åke Christian Gram, Helsingborg, all of Sweden, assignors to Helsingborgs Spikfabriks AB, Helsingborg, Sweden

Filed Nov. 10, 1972, Ser. No. 305,419

Int. Cl. B65b *27/10*

U.S. Cl. 53—198 R **10 Claims**



1. Apparatus for continuously producing strips of spaced fasteners, comprising in combination first guide means, means for continuously aligning individual fasteners in a row with the fasteners extending generally parallel to and spaced from each other, means for moving said aligned fasteners along a path determined by said first guide means tape applying and securing means for applying tape means in engagement with said aligned fasteners in the longitudinal direction of the row and for securing together said tape means and aligned fasteners for producing a web of fasteners fixed in space relationship by said tape means, means for moving said web along a path from said tape applying and securing means, to a cutting means, said cutting means cutting said moving web into individual strips, second means for moving said individual strips to a stacking station, the apparatus further comprising strip catching and stacking means located at said stacking station for catching each of said strips received from said second means and stacking it in a stack at said stacking station, said strip catching and stacking means being adapted to selectively release said strips and turn each released strip around an axis parallel with the longitudinal axis of said strip to stack every second strip on its right side and the other strips on their left side in said stack, wherein said strip catching and stacking means includes second guide means receiving said strips from said second means moving said strips, said second guide means being movably mounted to move between a first position supporting said strips within said second guide means and a second position wherein said strips are released to fall by gravity from said second guide means, and third means actuated by a one of said strips received in said second guide means and moving said second guide means respectively between first and second positions.

3,889,451

CAPPING SPINDLE FOR SECURING CLOSURES ON CONTAINERS

Daniel J. Burkhardt, Richmond, Ind., assignor to Aluminum Company of America, Alcoa Center, Pa.

Filed June 5, 1974, Ser. No. 476,480

Int. Cl. B65b *7/28;* **B67b** *3/12, 3/26*

U.S. Cl. 53—342 **10 Claims**

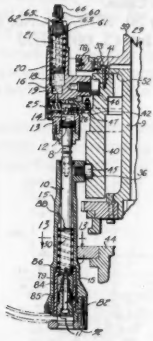
1. Apparatus for securing a closure on a container having a finish thereon comprising:

a draw die adapted to be moved upwardly with respect to a closure having an outwardly projecting protuberance on its skirt for constructing the protuberance inwardly toward a container finish to secure the closure on the container,

means for moving the draw die upwardly and downwardly with respect to a closure on a container,

a pressure block,

means for resiliently pressing said pressure block against a closure on a container, and



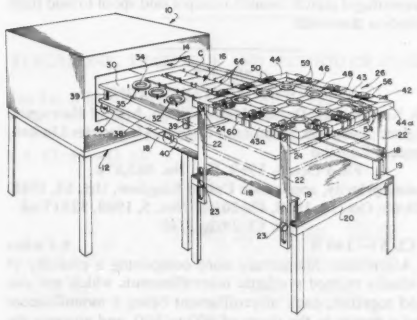
means for locking the pressure block in position against the closure on the container as the draw die is moved upwardly with respect to the container to secure the closure on the container.

3,889,452

APPARATUS FOR PRELOADING A TRAY AND TRANSFERRING THE PRELOADED MATERIAL TO A SEALING FIXTURE FOR HEAT SEALING

Robert L. Loeffler, Chicago, and Ronald D. Winsor, Downers Grove, both of Ill., assignors to Package-King, Inc., Chicago, Ill.

Filed Apr. 18, 1973, Ser. No. 352,103
Int. Cl. B67b *67/00, 67/02*
U.S. Cl. 53—390 **7 Claims**



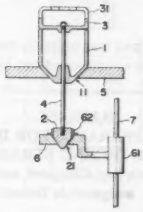
1. A preloading tray for supporting flanged bubbles for use in connection with a heat sealing apparatus and a slidably supported sealing fixture, said preloading tray positioned in spaced relation to said heat sealing apparatus with said sealing fixture between said heat sealing apparatus and said preloading tray and slidably movable into and out of said heat sealing apparatus and also under said preloading tray, said preloading tray including a frame member having a plurality of resiliently mounted spaced members connected to said frame and providing open spaces between said members, with the flanges of the bubbles positionable to rest on said spaced members with the bubble extending therebelow and adapted to support a product therein, means for mounting said sealing fixture slidably directly under said preloading tray to permit transfer of said bubble and product to said sealing fixture by moving said bubble downwardly so that the flange of the bubble passes between the spaced members so that said preloading tray remains free for subsequent preloading as said sealing fixture is moved into and out of said heat sealing apparatus.

3,889,453

MEANS FOR OPENING TUBULAR NET CUT END FOR NET BAG PACKAGING

Akira Hirai, 1413 Nobidome, Niiza-shi, Saitama-ken, Japan

Filed Jan. 28, 1974, Ser. No. 437,276
Claims priority, application Japan, Jan. 29, 1973, 48-11734
Int. Cl. B65b *67/02*
U.S. Cl. 53—390 **3 Claims**



1. Means for opening tubular net cut end for net bag packaging device which comprises a guide block having in one body a main block, a lower block and an upper block, said main block being substantially cylindrical and having a conical wall face facing downwardly at the bottom portion thereof, said lower block having also a conical wall face facing downwardly at the bottom portion thereof, and said upper block being substantially cylindrical and having a diameter similar to that of said main block so that said upper block can be seated on and supported by said main block, said lower and upper blocks being connected to each other with a rod extending therebetween and through said main block slideably, a fixed arm for supporting said main block having a seat portion for engaging said conical wall face of said main block through the medium of a tubular net texture, and a movable arm for supporting said lower block having a seat portion for engaging said conical wall face of said lower block through the medium of said net texture, said movable arm being provided for running at a predetermined stroke between a lower dead point which corresponds to a position of said upper block in which is seated said upper block on said main block and an upper dead point which corresponds to a position of said upper block in which is held the net cut end open.

3,889,454

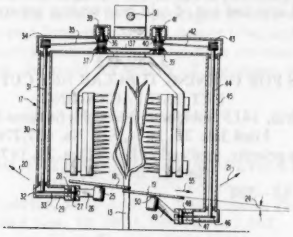
GRAPE AND JUICE RECOVERING DEVICE TO BE FITTED TO A GRAPE-GATHERING MACHINE

Alain Bruel, Domaine du Petit Chaumont, Aigues Mortes, France

Filed June 7, 1973, Ser. No. 367,904
Claims priority, application France, June 7, 1972, 72.21141
Int. Cl. A01g *19/00*
U.S. Cl. 56—330 **8 Claims**

1. A grape and juice recovering device for a grape gathering machine comprising support means extending in the longitudinal direction of movement of said machine, at least one inverted U-shaped frame pivotally mounted on said support means for transverse movement with the lower ends of the two arms of the inverted U extending downwardly for disposition on opposite sides of a vine stock, a vertical pivot pin rotatably mounted on the lower end of each arm, a lever mounted on each pin at one end thereof, a freely rotatable disk mounted on the opposite end of each lever, said disks being disposed in overlapping relationship parallel to a common plane which is

disposed at a slight inclination with respect to the horizontal, each of said disks having a plurality of peripheral notches for



engaging a vine stock and transmission means interconnecting said levers for simultaneous movement in the same direction.

3,889,455

METHOD AND APPARATUS FOR IMPREGNATING STRANDED WIRES DURING STRANDING THEREOF

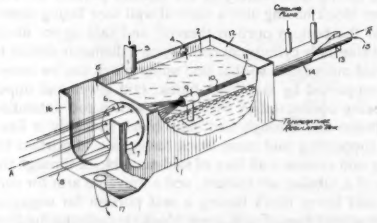
Antonio Portinari, Sesto San Giovanni, and Giovanni Alimenti, Milan, both of Italy, assignors to Industrie Pirelli Societa per Azioni, Milan, Italy

Filed July 24, 1973, Ser. No. 382,274

Claims priority, application Italy, Aug. 2, 1972, 27778/72

Int. Cl. B65h *81/08*; **H01b** *3/42, 13/24*

U.S. Cl. 57—7 **7 Claims**



4. Apparatus for cooling and filling the spaces within a strand of elongated conductive components with a water-impermeable and electrically insulating filling medium having a predetermined dropping point temperature during the twisting of the components forming said strand comprising at least one temperature regulated tank for receiving said filling medium and maintaining said medium at a temperature above said dropping point temperature and at a predetermined level, said tank having a first wall at one end of said tank and a second wall at the opposite end of said tank, said first wall having a plate portion with a plurality of holes therethrough, one for each of said components, disposed in spaced relation to each other around the center of a circle, said holes being located below said level of said medium, said second wall having a hole therethrough approximately equal but greater in size than the periphery of said strand and said hole being located below said level of said medium, at least one stranding die in said tank between said plate and said hole for receiving said components and guiding them as they are stranded at said die, said die being located below said level of said medium, a tube connected at one end to said hole and located exteriorly of said tank for receiving and guiding said strand as it leaves said tank, said tube having an internal size approximately equal to but greater in size than the periphery of said strand for smoothing and shaping the medium on said strand, and means for cooling said tube to a temperature below said dropping point temperature.

3,889,456

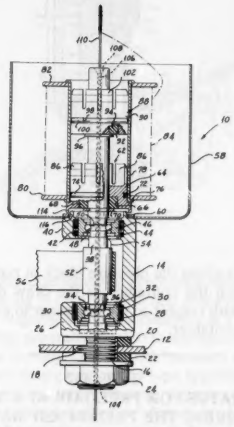
YARN COVERING SPINDLE

Lewis W. McKee, Westlake Village, Calif.; William E. Donner, Brookfield Center, Conn.; Victor B. Oliva, Danbury, Conn.; Harold R. Berglund, Newtown, Conn., and John C. Morrison, Brookfield, Conn., assignors to The Barden Corporation, Danbury, Conn.

Filed May 30, 1974, Ser. No. 474,534

Int. Cl. D01h *7/12*

U.S. Cl. 57—18 **17 Claims**



1. Apparatus for applying a covering yarn from a spool having a hub to a core yarn including in combination, a shaft having an axial bore extending therethrough for receiving said core yarn, means supporting said shaft for rotary movement, centrifugal clutch means carried by said shaft for receiving the hub of said spool, and means for driving said shaft to cause said centrifugal clutch means to couple said spool to said shaft for rotation therewith.

3,889,457

MACROFILAMENTARY YARNS

Derek Kenyon, and Donald James Wilson, both of Harrogate, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 6, 1969, Ser. No. 863,872

Claims priority, application United Kingdom, Oct. 11, 1968, 48328/68; Oct. 14, 1968, 48620/68; Nov. 5, 1968, 52417/68

Int. Cl. D02g *3/48*

U.S. Cl. 57—140 R **8 Claims**

1. A synthetic filamentary cord comprising a plurality of individually twisted synthetic macrofilaments which are also twisted together, each macrofilament being a monofilament having a denier in the range of 400 to 600, and wherein the twist level in the cord is between 2 and 12 turns per inch and the denier of the cord is in the range of 1,000 to 10,000.

3,889,458

ELECTRONIC CLOCK DEVICES

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co. Ltd., Tokyo, Japan

Filed Mar. 15, 1973, Ser. No. 341,583

Claims priority, application Japan, Mar. 15, 1972, 47-26381; Apr. 21, 1972, 47-40086

Int. Cl. G04b *19/24, 19/30*

U.S. Cl. 58—4 A **5 Claims**

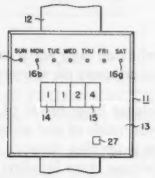
1. An electronic clock device comprising:

a clock signal generator for generating a clock signal having a highly stable frequency;

first counter means responsive to said clock signals for counting the six values of units of ten-seconds obtained from the clock signal of said clock signal generator at an interval of ten seconds, for generating outputs corresponding to said six values and for generating a stepping output every 60 seconds;

second counter means for counting units of minutes which is operated stepwisely by the stepping output of said first counter means and for generating a stepping output every 60 minutes;

third counter means for counting units of hours which is operated stepwisely by the stepping output of said second counter means and for generating a stepping output every 24 hours;



fourth counter means for counting the seven valves of the days of a week which is operated stepwisely by the stepping output of said third counter means and for generating seven output values which correspond to the respective 7 days of the week;

first display means coupled to and displaying the contents of said second and third counter means;

second to eighth display means coupled to said fourth counter means providing respective unique displays corresponding to the seven output values of the output of said fourth counter means; and

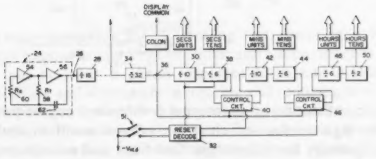
display switching means for displaying the six values of the output of said first counter means by using six display means of said second to eighth display means.

3,[illegible]

ELECTRONIC TIMEPIECE AND METHOD OF MAKING THE SAME

Sun Lu, 3 Elm St., East Setauket, N.Y. 11733

Filed June 1, 1973, Ser. No. 366,012
Int. Cl. G04c *3/00*; G04b *19/30*
U.S. Cl. 58—23 AC **9 Claims**



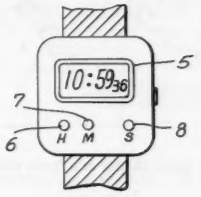
1. An electronic timepiece comprising display means for displaying time in digital readout form, a resistor-capacitor oscillator time base generator operative to produce a first train of output pulses having a preselected pulse repetition frequency, and logic circuit means connected to the output of said time base generator and operative to count down said first time base pulse train to provide second and third pulse trains having pulse repetition frequencies of one pulse per hour and one pulse per minute respectively, said time base generator and said logic circuit means being in the form of an integrated circuit mounted on said display means, said time base generator including a timing resistor comprising first and second resistors the resistance value of said first resistor being at least several times as large as the resistance value of said second resistor.

3,889,460

METHOD AND APPARATUS FOR CORRECTING TIME IN AN ELECTRONIC WRISTWATCH

Hideaki Yasukawa, and Okito Naito, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed June 18, 1973, Ser. No. 371,084
Claims priority, application Japan, June 19, 1972, 47-61101
Int. Cl. G04c *3/00*; G04b *19/38, 27/00*
U.S. Cl. 58—23 R **6 Claims**



1. An electronic timepiece comprising oscillator means for producing a high frequency time standard signal, divider means for producing low frequency timing signals from said high frequency time standard signals including a plurality of series-connected divider stages, certain of said divider stages corresponding to seconds display, means for the digital display of time in response to said timing signals, said digital display means displaying at least seconds and minutes, said seconds divider stages providing a substantially square-wave output signal having a period of 1 minute to the next divider stage, and correction means for applying a reset signal to said certain divider stages which correspond to the incorrect time displayed, said correction means being adapted to set the second digital display to zero without affecting the minute digital display when said reset signal is applied to said certain dividers during the first half cycle of said output signal when the seconds digital display means is 30 or less and to set the second digital display to zero and increase the minute digital display by one when said reset signal is applied to said certain dividers during the second half cycle of said output signal when said seconds digital display read more than 30.

2. An electronic timepiece as claimed in claim **1**, wherein said certain divider stages are a 1/6 divider stage corresponding to a 1-second display and ⅓ and ½ divider stages corresponding to a 10-second display.

3,889,461

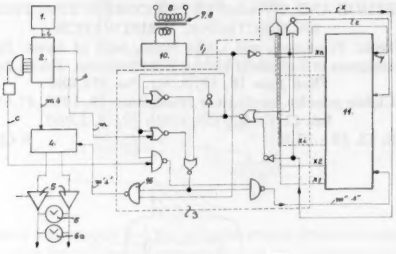
MASTER CLOCK WITH ELECTRONIC MEMORY

Raymond Marti, Meyrin, Geneva, and Olivier Chanson, Avully, Geneva, both of Switzerland, assignors to Patek Philippe S.A., Geneva, Switzerland

Filed Oct. 19, 1973, Ser. No. 407,963
Int. Cl. G04b *1/00*
U.S. Cl. 58—25 **2 Claims**

1. In a master clock comprising an oscillator, a divider connected to the output of said oscillator, a signal shaper, an output amplifier receiving signals from said signal shaper, and means to supply power to the clock from a power circuit through a battery to said oscillator and divider and shaper and directly to the rest of the clock; the improvement comprising a voltage detector for said circuit, a memory and a logic device receiving signals from the voltage detector and transmitting signals to said signal shaper, said logic device having means switching the output of the divider from the signal shaper to the memory when the circuit voltage falls below a predetermined value, said logic device also having means

responsive to re-establishment of voltage in said circuit above said predetermined value to feed out signals stored in said



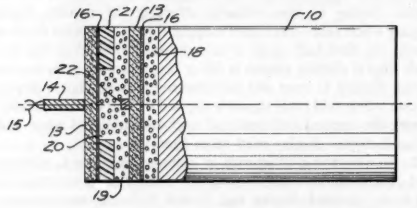
memory to said signal shaper at a faster rate than their rate of storage.

3,889,462

CONSUMABLE DETONATION REACTION ENGINE AND SYSTEM

Rudi Beichel, Sacramento, and Charles J. O'Brien, Citrus Heights, both of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Filed Apr. 22, 1971, Ser. No. 136,368
Int. Cl. F02k *9/04*, *9/06*
U.S. Cl. 60—250 **14 Claims**



1. A consumable detonation-reaction engine adapted to be mounted on the end of a payload, said engine comprising a plurality of stages arranged in tandem along an axis extending in the direction of forward impulse, each said stage comprising:

an explosive member;

means adapted to said explosive member for detonating the explosive;

a flame-front-filtering means in front of the explosive member for restricting propagation of the flame front through it in the forward direction; and

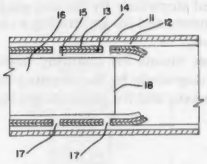
a shock-wave-attenuating means in front of the filtering means and comprising a structure of air impregnated foam material having a predetermined compressibility substantially mismatching the compressibility of the explosive member and the flame front filtering means for reducing the impulse of the shock wave passing forwardly through it and more evenly planarly distributing said impulse.

3,889,463

STRESS RELIEVING LINER

Anthony San Miguel, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 27, 1974, Ser. No. 483,595
Int. Cl. F02k *9/04*
U.S. Cl. 60—255 **5 Claims**



1. In a stress relieving liner for a rocket motor comprising:

an insulator layer adjacent to the motor casing and bonded thereto;

a perforated release layer inside of the insulator layer;

an inhibitor layer inside of and adjacent to the release layer and columns extending through the perforations in the perforated release layer bonding the insulator layer and inhibitor layer to one another;

the improvement residing in a perforated layer of heat shrinkable material between and adjacent to the insulator layer and release layer;

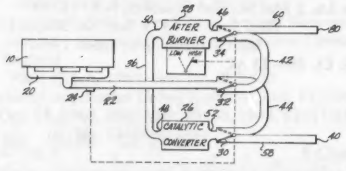
the perforations in said perforated layer of heat shrinkable material corresponding to the perforations in the perforated release layer so that the columns which bond the insulator layer and inhibitor layer together can extend through both the layer of heat shrinkable material and the release layer.

3,889,464

EXHAUST EMISSION CONTROL SYSTEMS AND DEVICES

Conrad O. Gardner, 22905 108th West, Edmonds, Wash. 98020

Filed Dec. 20, 1973, Ser. No. 426,516
Int. Cl. F01n *3/14*
U.S. Cl. 60—286 **2 Claims**



1. In combination in an internal combustion engine power plant having a combustion chamber, exhaust manifold, and an exhaust passage for exhaust gas flow from said exhaust manifold to the atmosphere:

a catalytic converter coupled in series with said exhaust passage effective to cause reaction of exhaust gas constituents flowing therethrough when the temperature of said catalytic converter is above a predetermined temperature level to thereby prevent emission of said constituents to the atmosphere;

an exhaust gas afterburner coupled in series with said exhaust passage downstream from said catalytic converter; means coupled to said afterburner for heating exhaust gas in said exhaust passage upstream from said catalytic converter to a temperature level greater than said predetermined temperature; and,

said means coupled to said afterburner comprising;

temperature sensing means responsive to the temperature of exhaust gas in said exhaust passage upstream from said catalytic converter; and,

duct means responsive to said temperature sensing means for coupling said afterburner in said exhaust passage upstream from said catalytic converter when the temperature sensed by said temperature sensing means is below said predetermined temperature, said duct means including means for reversing the exhaust flow path through said exhaust gas afterburner and said catalytic converter; and,

means for switching said afterburner to a lower temperature when the temperature sensed is below said predetermined temperature and switching said afterburner to a higher temperature in response to detection of exhaust gas temperature above said predetermined temperature.

3,889,465
APPARATUS FOR CONTROLLING THE POWER OF A HOT-GAS PISTON ENGINE

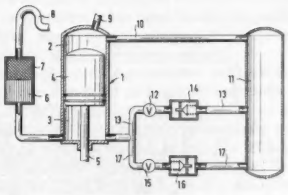
Falk Gartner, Mannheim, Germany, assignor to Motoren-Werke Mannheim AG

Filed June 24, 1974, Ser. No. 482,162

Claims priority, application Germany, June 25, 1973, 2332192

Int. Cl. F03g *7/06;* **F25b** *9/00*

U.S. Cl. 60—521 **9 Claims**



1. An apparatus for controlling the power of a hot-gas piston engine having a hot chamber and a separate cold chamber per cylinder; a piston displaceable in said cylinder for selectively and alternately increasing and reducing in size said chambers; a flow path for selectively connecting said hot chamber with said cold chamber of the same engine cylinder, and with another cylinder operating in a phase-displaced manner; said flow path including in succession a heater, a regenerator and a cooling device; a container operatively connected with said chambers; a flow-restricting conduit for connecting said hot chamber with said container; and two non-return valves for selectively connecting the interior of said container with said cold chamber; whereby the engine power is increased by connecting said interior with said cold chamber by way of one of said valves, which allows flow from said hot chamber by way of said container into said cold chamber, whereas the power is reduced when said interior is connected with said cold chamber by way of the other one of said valves, which allows flow from said cold chamber by way of said container into said hot chamber.

3,889,466
DEVICE FOR MAINTAINING A WORKING FLUID UNDER A PREDETERMINED PRESSURE

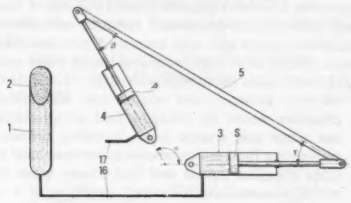
Andre Castela, Le Mesnil Le Roi, and Philippe Joubert, Meudon La Foret, both of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, France

Filed May 2, 1973, Ser. No. 356,435

Claims priority, application France, May 2, 1972, 72.16071; June 23, 1972, 72.22953; June 23, 1972, 72.22954

Int. Cl. F15b *7/00*

U.S. Cl. 60—533 **18 Claims**



1. A device for maintaining a working fluid in a pipe under a determined pressure, making use of a source of pressurized auxiliary fluid in communication with a chamber of variable volume, in which the pressure of the auxiliary fluid varies in inverse proportion with respect to the volume of the chamber, said said comprising an assembly of at least two jacks, each of said two jacks being disposed at an angle with respect to one another, and each of said two jacks comprising two elements, said two elements including a cylinder and a piston rod; and at least one rigid connecting rod joining at least respective first elements of said two elements of each of fsaid two jacks of said assembly, the cylinder of a first jack of said two jacks of said assembly being connected to the source of pressurized auxiliary fluid and forming the chamber of variable volume, and the cylinder of a second jack of said two jacks of said assembly supplying a pipe with working fluid.

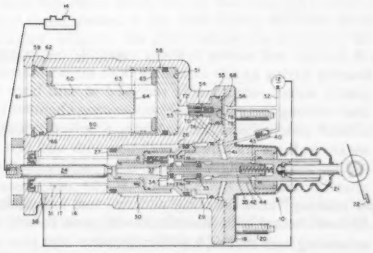
3,889,467
ACCUMULATOR ARRANGEMENT FOR A BOOSTER BRAKE MECHANISM

Herman M. Huffman, Owosso; Kenneth B. Swanson, Bannister, and Kenneth D. Jensen, Owosso, all of Mich., assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed June 24, 1974, Ser. No. 482,482

Int. Cl. F15b *7/00*

U.S. Cl. 60—548 **13 Claims**



1. A booster mechanism operable by a source of fluid capable of supplying minimum pressure and a higher operating pressure to the booster mechanism, said mechanism comprising:

a housing having a longitudinally extending cavity therein,

an input member extending into said cavity at one end

thereof and an output member extending from said cavity at its opposite end;

piston means between said input and output members for moving said output member in response to movement of said input member, said piston means including a power chamber at one side thereof;

inlet and outlet valve means associated with said input member within said cavity and operable upon inward movement of said input member to provide fluid communication between said source at operating pressure and said power chamber for actuating said piston means;

accumulator chamber means associated with said housing operable to store a predetermined volume of fluid;

dump valve means interposed between said accumulator chamber means and said source of pressure and check valve means associated with said dump valve means;

said check valve means operable to provide fluid communication between said source and said accumulator chamber means for charging said accumulator chamber when said source is at operating pressure while preventing fluid communication between said accumulator chamber means and said source when the fluid within accumulator chamber means is at a pressure greater than said minimum pressure of said source,

said dump valve means operably biased by the pressure from the fluid within said accumulator chamber means towards a first position and operably biased by the pressure from said source

towards a second position; and

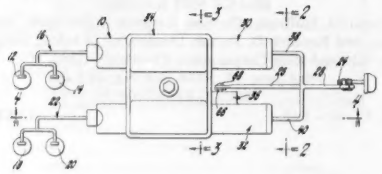
first passage means within said housing providing fluid communication between said inlet and outlet valving means and said accumulator chamber means when said dump valve means is in its first position while preventing communication therebetween when said dump valve means is in its second position.

3,889,468

POWER BOOSTER AND MASTER CYLINDER ASSEMBLY

Larry D. Blumer, Gaines, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 4, 1974, Ser. No. 447,737
Int. Cl. F15b 7/00
U.S. Cl. 60—548 **3 Claims**



1. A booster and master cylinder assembly comprising:

a housing having axially extending bore means therein, first piston means reciprocably received in said bore means and defining therewith fluid pressurizing chamber means; second piston means reciprocably received in said bore means in force transmitting relation with said first piston means and defining with said bore means fluid power chamber means;

said housing further having a cylindrical valve chamber formed therein with the axis thereof skew to said axially extending bore means, a power pressure inlet port and an outlet port and a fluid passage communicating with said cylindrical valve chamber in circumferentially spaced relation, said fluid passage also communicating with said fluid power chamber means;

and a rotary valve member mounted in said valve chamber for controlled rotational movement about the chamber axis to selectively and controllably fluid connect said passage to one of or neither of said ports to deliver and modulate and remove power pressure to and from said fluid power chamber means to move said second piston means and said first piston means to selectively pressurize and modulate and reduce fluid pressure in said fluid pressurizing chamber means;

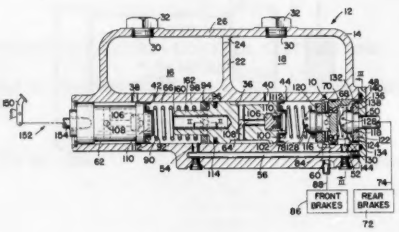
said valve member having an axially extending chamber positioned centrally thereof; circumferentially spaced peripheral chamber walls cooperating with said valve chamber to define first, second, and third peripherally spaced chambers respectively associated with said inlet port, said outlet port, and said fluid passage; and first, second and third valve passages therein respectively providing continuous fluid communication between said axially extending chamber and said first, second and third peripherally spaced chambers; the lateral chamber walls of said second and third peripherally spaced chamber converging to define said second and third peripherally spaced chambers as variable restrictions to fluid flow therethrough with rotary valve movements in the brake apply and release directions modifying the restrictions to fluid flow in cooperation with said outlet port and said fluid passage.

3,889,469

TANDEM MASTER CYLINDER WITH IN-LINE CHECK VALVES

John R. Cryder, Joliet, and Lowell R. Hall, Manhattan, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 21, 1974, Ser. No. 434,778
Int. Cl. F15b 7/00
U.S. Cl. 60—562 **10 Claims**



1. A tandem master cylinder assembly for a dual brake system, said assembly comprising:

a housing having an elongated cylindrical bore formed therein, said bore having a first end and a second end;

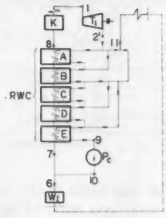
a fluid reservoir adjacent said bore and communicating therewith;

first and second pistons axially reciprocably mounted in said bore for movement in a forward direction toward said first end and a rearward direction toward said second end and operative upon movement in said forward direction to pressurize fluid within said cylinder ahead of said respective pistons, said pistons dividing said bore into first and second chambers;

first and second outlet means for separately communicating pressurized fluid from each of said first and second chambers; and,

first and second check valve means disposed along the axis of said bore at said first end for separately controlling said outlets.

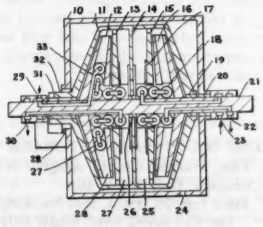
3,889,470
METHOD OF IMPROVING THE POWER CYCLE EFFICIENCY OF A STEAM TURBINE FOR SUPERCRITICAL STEAM CONDITIONS
Robert Szewalski, Gdansk-Wrzeszcz, Poland, assignor to Polska Akademia Nauk Instytut Maszyn Przeplywowych, Gdansk, Poland
Filed June 8, 1973, Ser. No. 368,122
Claims priority, application Poland, June 10, 1972, 155928
Int. Cl. F01k 7/40
U.S. Cl. 60—647 4 Claims



1. A method of improving the efficiency of the power cycle of a steam turbine for initial supercritical steam conditions comprising the steps of expanding the working fluid from the initial supercritical steam conditions to a lower pressure which is higher than the critical pressure; dividing the working fluid into two streams; cooling one stream in a high temperature regenerative heat exchanger as a heating stream for yielding its heat to a feed water stream passing through the heat exchanger and constituting a heated stream; further expanding the other of said two streams in the turbine; mixing thereafter said one stream after it has passed through the exchanger with said other stream after it has been further expanded to constitute the feed water stream entering the regenerative heat exchanger;

the high temperature regenerative heat exchanger being divided into a number of successive sections and varying the ratio of the mass flow rates of the heated stream to the heating stream in successive sections in said heat exchanger in stepped manner to provide substantially constant temperature differences between the two streams in the sections of the heat exchanger by selectively dividing a part of one of the streams from one section of the heat exchanger to another.

3,889,471
DUAL ROTOR DUAL FLUID TURBINE
Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77042
Filed Nov. 6, 1973, Ser. No. 413,258
Int. Cl. F01k 25/00, 23/02
U.S. Cl. 60—655 3 Claims



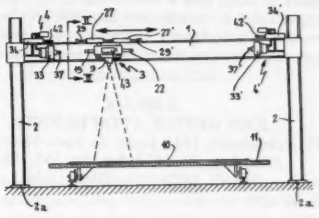
3. A method for generating power comprising:

a. passing two gaseous fluids in heat exchange relationship with each other during and after compression within a rotating centrifuge; with one of said fluids receiving heat the other fluid having heat removed;

b. expanding both fluids within a second rotor with extraction of work;

c. adding heat to one of said fluids in a heat exchanger during and after expansion by circulating a heat exchange fluid within said heat exchanger for adding said heat; said heat exchange fluid being the fluid releasing heat to said other fluid during said compression.

3,889,472
RECIPROCATING APPARATUS
Michel Guillaud, Grenoble, France, assignor to Secmer, S.A., Isere, France
Filed June 18, 1973, Ser. No. 370,639
Int. Cl. F01b 7/02
U.S. Cl. 60—698 6 Claims



1. Apparatus for reciprocating a carriage which is mounted to move freely to and fro between two extreme positions upon a traverse girder, said apparatus comprising:

a. a source of fluid under pressure;

b. on the girder at each of said extreme positions a fluid impulse mechanism operative to deliver thrust to said carriage when it reaches the extreme position to cause it to travel by inertia to the opposite extreme position; and valve means coupled between said source and each impulse mechanism and operative when actuated to deliver fluid pressure to the impulse mechanism;

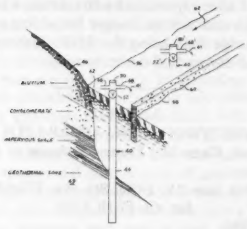
c. on said carriage arm means located to actuate the valve means when the carriage reaches each of said extreme positions thereby to pressurize the adjacent impulse mechanism, and said carriage comprising a body having a bore extending therethrough and aligned with said fluid impulse mechanism, a pair of axially aligned gudgeon pins extending from both sides of the body and reciprocably captivated in the bore and disposed respectively to receive the thrust from one of said impulse mechanisms, and spring means in the bore urging the pins outwardly thereof, whereby the pins cushion the impact of the impulse mechanisms.

3,889,473
GEOTHERMAL CHANNEL AND HARBOR ICE CONTROL SYSTEM
Allen T. Van Huisen, 29456 Indian Valley Rd., Rolling Hills Estates, Calif. 90274
Division of Ser. No. 220,801, Jan. 26, 1972, Pat. No. 3,807,491. This application Mar. 8, 1974, Ser. No. 449,351
Int. Cl. E02b 5/04, 3/00
U.S. Cl. 61—1 R 9 Claims

1. A method of forming an open shipping channel between two navigable bodies of water separated by a frozen ice barrier comprising the steps of:

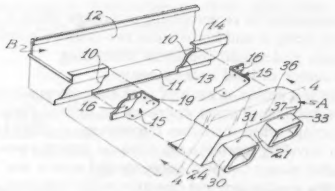
drilling a plurality of geothermal wells through the surface of the earth lying beneath the ice and water into a deep, hot rock geothermal subsurface strata spaced along a route joining the bodies of water;

transferring heated fluid at a temperature of at least 100°F from the lower hot end of each well to a surface of the frozen ice barrier in an amount sufficient to melt the frozen ice barrier until the frozen ice barrier melts to



form a water filled channel joining the wells and the bodies of water into a continuous open, navigable shipping channel at least 80 feet in width; and lining at least one side of the channel with a wall of thermal insulating material, extending above the wave and water line.

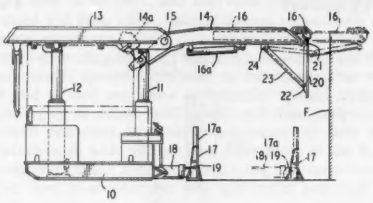
3,889,474
RAIN GUTTER ATTACHMENTS
Alvin W. Frangmeier, 1042 Jenks, St. Paul, Minn. 55104
Filed Aug. 27, 1973, Ser. No. 391,788
Int. Cl. E02b *9/04;* **E04d** *13/06*
U.S. Cl. 61—14 **9 Claims**



1. A rain gutter attachment for use in conjunction with a rain gutter having a rear wall, a bottom wall, and a front wall, a portion of said front wall being cut away to provide a notch, angular clips including one flange having a contour to fit the contour of said front wall of said gutter, and a second right angularly extending flange extending forwardly from the front wall of said gutter, an enclosure having a rear wall, a front wall, and a parallel end wall connecting each of the ends of said front and rear walls of said enclosure, means securing the end walls of said enclosure to the second flanges of said clips, said rear wall of said enclosure including a lower inlet opening, the lower edge of which is adjacent to the bottom wall of said gutter, said rear wall of said enclosure communicating with the rain gutter, said rear wall having an upper inlet opening therethrough near the upper extremity of said rear wall, conduit means within said enclosure communicative with each of said upper and lower inlet openings, and means for connecting each said conduit means to a downspout.

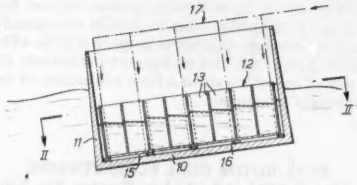
3,889,475
MINE ROOF SUPPORTS
Archelaius Dawson Allen, Leyland, England, assignor to Gullick Dobson Limited, Lancashire, England
Filed Dec. 28, 1973, Ser. No. 429,674
Claims priority, application United Kingdom, Jan. 26, 1973, 3974/73
Int. Cl. E21d *15/44*
U.S. Cl. 61—45 D **5 Claims**

1. A mine roof support having a first roof-engaging structure, a second roof-engaging structure slidable with respect to said first roof-engaging structure to form an extension thereof, pressure-fluid-operated ram means connected to said second roof-engaging structure for effecting sliding movement thereof with respect to said first roof-engaging structure and an anti-spalling baffle pivotally connected to said second roof-engaging structure, a link arrangement pivotally connected at one end to said first roof-engaging structure and at its opposite end to a point on said baffle spaced from the



pivotal connection of said baffle to said second roof-engaging structure whereby upon operation of said ram means to retract said second roof-engaging structure from extended state said baffle is pivoted into an operative position in which it depends substantially vertically from said second roof-engaging structure and upon operation of said ram means to extend said second roof-engaging structure said baffle is pivoted into a stowed position in which it lies along said second roof-engaging structure.

3,889,476
SUBMERSIBLE CAISSONS AND THEIR APPLICATIONS
Gerald Gerin, 41 Avenue Egle, Maisons-Lafitte, France (78600)
Filed Feb. 2, 1973, Ser. No. 329,087
Int. Cl. E02d *5/00, 23/02*
U.S. Cl. 61—46 **19 Claims**



1. An offshore caisson of prestressed reinforced concrete for use in the construction of sea or river works, comprising a sea-worthy structure including a bottom, at least one lateral wall, and means for dividing up liquid ballast in the caisson comprising, in section substantially parallel to the bottom, a cellular structure independent of said wall and said bottom, and means supporting said cellular structure in spaced relation from said wall and said bottom.

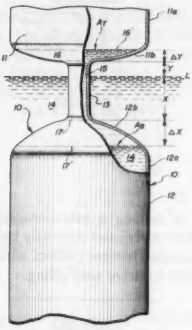
3,889,477
CRUDE OIL OFFSHORE STORAGE VESSEL
William A. Tam, Warrenville, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.
Filed Jan. 28, 1974, Ser. No. 436,905
Int. Cl.² **B65G** *5/00;* **B65D** *89/10*
U.S. Cl. 61—46.5 **10 Claims**

1. A self-ballasting offshore storage tank of the water-displacement type for the storage of a liquid lighter than and immiscible with water comprising:

a vertically elongaged continuous enclosure open at the bottom for ingress and egress of water;

means for positioning said tank at a substantially fixed level relative to the surface of a body of water in which said tank is situated, when said tank contains only water filling the lower portion of said enclosure up to the level of the surrounding body of water;

said continuous enclosure having an upper section which extends above the surface of said body of water and a lower section which is always submerged;



said enclosure having a cross-sectional area which has a minimum value at the junction between said upper and lower sections, each of said sections having a respective maximum cross-sectional area larger than said minimum value, said area varying above and below said junction in a manner such that the upper and lower interfacial surfaces of a body of said liquid stored in said enclosure remain substantially equal regardless of the quantity of said liquid.

3,889,478

VEHICLE GUIDANCE

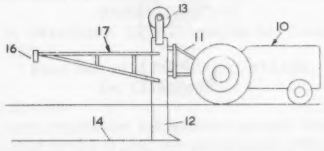
Leonard Marshall, Fleet, England, assignor to C.A.V. Limited, Birmingham, England

Filed Dec. 28, 1973, Ser. No. 431,324

Claims priority, application United Kingdom, Dec. 29, 1972, 59997/72

Int. Cl. F16l *1/00*; G08b *21/00*

U.S. Cl. 61—72.6 **15 Claims**



1. A method of laying a guidance conductor of the kind intended to be used in a vehicle guidance system comprises first laying a short length of conductor to a high degree of accuracy, passing an electric current through the conductor, laying the remaining length of conductor using a wire laying vehicle and guiding the path followed by the wire laying vehicle using a guidance system including a sensing head on the vehicle and disposed to provide guidance signals generated by the current flowing in said short length of conductor and in the conductor subsequently laid by the wire laying vehicle.

3,889,479

MEANS FOR DISPLACING STRUCTURES

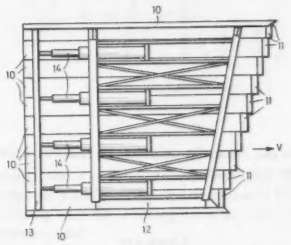
Rolf Trott, Selm, Germany, assignor to Gewerkschaft Eisenhutte Westphalia, Westfalia, Germany

Filed June 21, 1973, Ser. No. 372,351

Claims priority, application Germany, Aug. 11, 1972, 2239565

Int. Cl. E01g *3/00*

U.S. Cl. 61—85 **9 Claims**



1. In combination, a tunnel driving shield comprising an anchor frame and a driving frame interconnected for relative movement longitudinally of the frames, a plurality of elongate, sharp ended shield elements connectable selectively to each of said frames, and hydraulic means including a plurality of hydraulic jacks connected between said frames, said jacks being arranged in at least three groups, each of which groups is associated with a hydraulic system comprising a pump, a control valve, a pressure line extending between the pump and the control valve, a return line extending between the control line and a tank from which hydraulic fluid is drawn by the pump, a first supply line connecting the control valve and a first chamber of each of the jacks and a second supply line connecting the control valve and a second chamber of each of the jacks, the control valve being positionable to connect the pressure line to either of the said supply lines and the return line to the other supply line, to extend or retract the jacks as required, the resultant forces pertaining to each group of jacks acting along a line located at a position intermediate the endmost jacks in each group, the lines of force applied by the at least three groups of jacks being equally spaced around said shield.

3,889,480

PROCESS OF, AND A PLANT FOR, CONSTRUCTING TUNNELS

Armin Lobbe, Oberaden, and Wolf-Rudiger Von Schenck Zu Schweinsberg, Borstel near Winson, Luhe, both of Germany, assignors to Gewerkschaft Eisenhutte Westphalia, Westfalia, Germany

Division of Ser. No. 292,470, Sept. 26, 1972, Pat. No. 3,834,170. This application May 1, 1974, Ser. No. 465,942

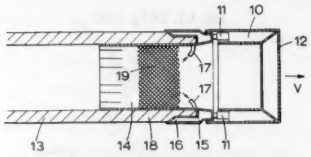
Claims priority, application Spain, Sept. 26, 1971, 395457; Nov. 12, 1971, 396949

Int. Cl. E01g *5/08*

U.S. Cl. 61—85 **4 Claims**

1. In a process of constructing an underground tunnel including the steps of operating a plurality of rams to advance a movable drive shield into a working face, introducing fluid concrete into a confining chamber rearwardly of the shield relative to the working face to form a lining for supporting the tunnel wall, and utilizing said fluid concrete as an abutment for the rams during the advancement of the drive shield, the

improvement comprising: removing water from the fluid concrete used to form the lining through filter means, whereby the



water passes out from the chamber to thereby accelerate the setting of the concrete.

3,889,481

MINE ROOF SUPPORT CHOCKS

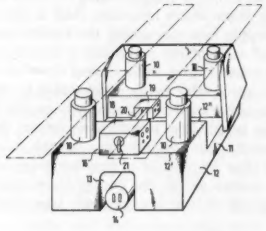
Walter Weirich, Dortmund, and Harry Rosenberg, Ludinghausen, both of Germany, assignors to Gewerkschaft Eisenhutte Westphalia, Westfalia, Germany

Filed Sept. 11, 1973, Ser. No. 396,262

Claims priority, application Germany, Sept. 14, 1972, 7233815[U]

Int. Cl. E21d *15/44*

U.S. Cl. 61—45 D **13 Claims**



1. A mine roof support chock composed of hydraulically operated props, a transverse beam connecting the props, which are in use disposed adjacent a mineral face, the beam having front and rear opposing walls facing outwardly and inwardly of the chock and an hydraulic control device for effecting operation of the chock; wherein the device is disposed on one of the front and rear walls of the beam and has a manually operable lever movable about an axis extending substantially perpendicular to the beam and laterally of the chock, the device has a maximum dimension extending in the direction of said axis so that a part of the device projects from the wall on which the device is disposed into a space between the front and rear walls, which part is connected to conduits located in said space, and the lever is spaced from and adjacent that one of the front and rear walls of the beam upon which the device is disposed.

3,889,482

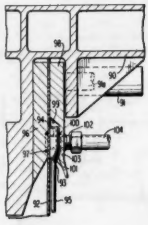
JET SHEET AND CIRCULAR PILE WITH WATER HAMMER ASSIST

Leonard Long Frederick, 15 Crestview Ter., Whippany, N.J. 07981

Division of Ser. No. 293,444, Sept. 29, 1972, Pat. No. 3,822,557. This application May 10, 1974, Ser. No. 469,026

Int. Cl.[2] E02D *7/18, 5/16*

U.S. Cl. 61—53.5 **8 Claims**



1. A method of driving a pile comprising vibrating said piling and simultaneously intermittently blocking a column of liquid to set up a water hammer effect which cooperates with the vibratory effect to drive said piling.

3,889,483

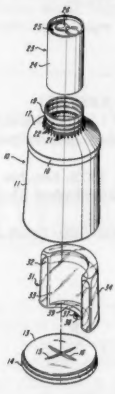
HEAT TRANSFER PACKAGE WITH SHAPED FRANGIBLE AMPULE

William R. Donnelly, Piqua, Ohio, assignor to Readi Temp, Inc., Piqua, Ohio

Filed Apr. 30, 1973, Ser. No. 355,924

Int. Cl. F25d *5/00*

U.S. Cl. 62—4 **12 Claims**



1. A heat transfer package comprising a receptacle including a base and, projecting therefrom, a self stabilizing upstanding wall structure, a first container adapted to pass heat to the contents which are to be subjected to heat transfer, said first container being mounted to have a portion thereof depend within and define with said wall structure a relatively sealed chamber, a portion of which chamber is defined by a spaced between the dependent extremity of said first container and said base, a second container, one portion of said second container positioned between a side portion of said first container and said wall structure, said space between the dependent extremity of said first container and said base and said

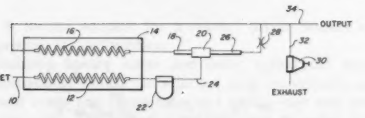
second container respectively containing materials characterized by being in an inactive state when separated by said second container but adapted, on contact, to interact and produce a heat transfer effect with respect to the contents of said first container, said second container being frangible and said wall structure embodying means to break said second container on said side portion of said first container whereby to produce, in said chamber, a heat transfer effect, as a result of which the temperature of the contents of said first container is charged.

3,889,484

GAS DRYING METHOD AND APPARATUS

John Vander Horst, Lakewood; Robert F. Hounshell, Sedalia, and Myron Dunn, Littleton, all of Colo., assignors to Wilkerson Corporation, Englewood, Colo.

Filed Jan. 30, 1974, Ser. No. 437,862
Int. Cl. F25b *9/02*
U.S. Cl. 62—5 **4 Claims**



1. The gas drying apparatus which comprises: a double-pass heat exchanger having the inlet to its first pass connectable to a high pressure supply of wet gas, a separator effective to collect the condensate removed by the heat exchanger connected to receive the relatively cooler partially dried gas issuing from the first pass thereof, a vortex tube operative to split an incoming stream of gas into a relatively colder fraction and a relatively hotter fraction connected to receive the partially dried gas from the separator and deliver the colder fraction thereof to the second pass of the heat exchanger for movement therein in heat exchange relation to the gas moving through the first pass thereof preparatory to recombining said colder and hotter fractions, a flow constrictor connected to restrict the flow of the relatively warmer fraction issuing from the vortex tube operative to effectively control division of flow within the latter, and a pressure relief valve connected to receive the recombined fractions, said relief valve being automatically operative to maintain a working pressure at a level substantially less than the supply pressure by bleeding off excessive air to the atmosphere while at the same time maintaining a near maximum pressure differential across the vortex tube within the available limits.

3,889,485

PROCESS AND APPARATUS FOR LOW TEMPERATURE REFRIGERATION

Judson S. Swearingen, 2235 Carmelina Ave., Los Angeles, Calif. 90064

Filed Dec. 10, 1973, Ser. No. 423,089
Int. Cl. F17c *13/12*
U.S. Cl. 62—54 **21 Claims**

1. A low temperature refrigeration process employing a working fluid having at least two components comprising the steps of

a. compressing said working fluid;

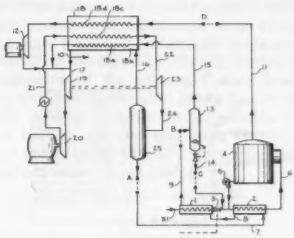
b. countercurrently passing the compressed working fluid in indirect contact heat exchange relationship with at least one returning stream having a lower temperature, whereby said working fluid is cooled;

c. substantially isentropically expanding said cooled working fluid to provide a vapor-liquid mixed working fluid;

d. separating the uncondensed vapor fraction from the condensed liquid fraction of said mixed working fluid;

e. returning the separated uncondensed vapor fraction to said heat exchange step and passing said vapor fraction countercurrently with the working fluid, as one of said returning streams;

f. delivering the separated condensed liquid fraction to an evaporating zone and evaporating said liquid fraction to deliver refrigeration;



g. returning the evaporated liquid fraction to said heat exchange step and passing said evaporated fraction countercurrently with the working fluid, as one of said returning streams; and

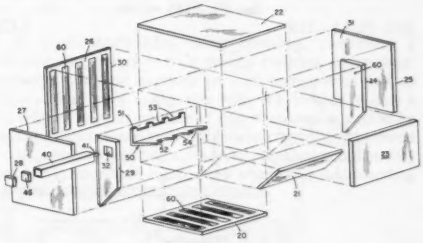
h. combining the returned evaporated fraction with the returned separated vapor fraction of step (e) to comprise said working fluid.

3,889,486

REFRIGERATION SYSTEM FOR AIR CARGO CONTAINERS

Grayson W. Hinckley, Menlo Park, and George Ikeda, San Francisco, both of Calif., assignors to Pax Systems, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 252,267, May 11, 1972, abandoned.
This application Jan. 23, 1974, Ser. No. 435,826
Int. Cl. F25d *25/05*
U.S. Cl. 62—62 **3 Claims**



1. A method of transporting perishable cargo in an enclosed air cargo container having an access door comprising the steps of

removably lining the interior walls and the access door of the air cargo container with rigid insulation panels which mutually support each other and which together define an enclosed space for containing the cargo;

lining those of the insulation panels against which the cargo will rest with raised slats to provide a flowpath for refrigerated air around the cargo;

refrigerating the enclosed space by installing a box adjacent the top of the enclosed space, insulating the box on at least two sides facing the enclosed space, and placing a frozen coolant within the box; and

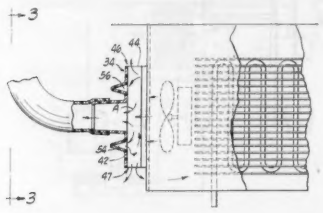
forcibly closing the access door against the resistance of the insulating panels to cause them to seal against each other.

3,889,487

COOLING SYSTEM FOR BEVERAGE COOLERS

Sandor Frankfurt, 20550 University Blvd., Shaker Heights, Ohio 44122

Filed May 18, 1972, Ser. No. 254,743
Int. Cl. F25d *17/02*
U.S. Cl. 62—99 **20 Claims**



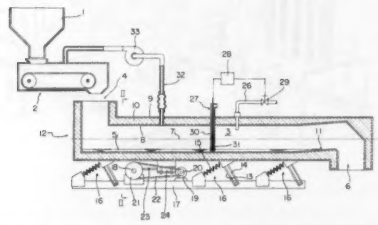
18. In a method of cooling a beverage dispensing faucet and adjacent conduit carried by a hollow faucet standard that communicates with a refrigerated chamber having a heat exchanger and a fan or blower associated with the heat exchanger for moving air thereacross, the steps comprising blocking air moved across the heat exchanger by the fan, causing the air to circulate within a confined zone a major part to discharge under pressure created by the fan through a conduit leading from said zone to the faucet standard and a minor part to discharge directly to the chamber, and allowing the air to escape from the conduit into the faucet standard and then return to the chamber.

3,889,488

REFRIGERATING APPARATUS

Hiroyuki Maeda, Nishinomiya, and Takuma Matsuda, Kobe, both of Japan, assignors to Osaka Gas Kabushiki Kaisha, Osaka, Japan

Filed Dec. 26, 1973, Ser. No. 427,685
Claims priority, application Japan, Dec. 27, 1972, 48-940
Int. Cl. F25b *41/04*
U.S. Cl. 62—218 **6 Claims**



1. A refrigerating apparatus comprising, in combination:

a. a tank for containing liquefied gas for refrigerating articles, said tank having an inlet end and an outlet end; and

b. means for advancing articles as placed in the liquefied gas within said tank from said inlet end to said outlet end to remove advanced articles from the liquefied gas, said means for advancing articles including

1. an article carrying member disposed at least partially beneath said liquefied gas in said tank and having a conveying surface for conveying such articles as may be placed thereon, said conveying surface extending substantially over the entire length of the distance between said inlet end and said outlet end and having at least a portion toward said outlet end gradually rising above a level of the liquefied gas within said tank, and

2. vibrating means moving said tank from outside thereof to move said conveying surface back and forth along a path, which is inclined upwardly toward said outlet end, for flinging the articles upwardly and toward said outlet end;

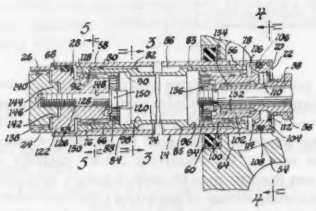
whereby articles introduced into the tank at the inlet end are moved toward the outlet end in a series of motions of the conveying surface which flings the articles upwardly out of the liquefied gas and forwardly toward the outlet end a number of times and finally to the outlet end.

3,889,489

LUBRICATED SPLINE COUPLING

John W. Casey, Mooresville; Sydney E. Easley, Indianapolis; Melvin O. Gough, Brownsburg, and William F. Jones, Indianapolis, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 23, 1974, Ser. No. 500,126
Int. Cl. F16d *3/06*
U.S. Cl. 64—9 R **3 Claims**

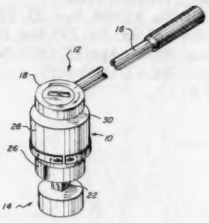


1. A spline drive coupling for maintaining alignment between first and second horizontal shafts arranged colinearly of one another comprising: an inner tubular member having a bore therethrough with spline surfaces at opposite ends of said bore, a plurality of grooves formed longitudinally of the outer surface of said inner tubular member, an open ended outer tubular member telescoped over said inner tubular member having spaced portions thereon secured to the outer circumferential surface of the opposite ends of said inner tubular member to close each of said grooves to define a lubricant return path therethrough, a first closure member slidably fit within one end of said outer tubular member and including an externally splined extension thereon interconnected within the spline surface on one end of said inner tubular member to define a first spline connection, a second closure member slidably fit within the opposite end of said outer tubular member and including an externally splined surface thereon interconnected with the spline surface at the opposite end of said inner tubular member to define a second spline connection, means forming an annular lubricant pickup on one end of said first closure member, an oil inlet hole through said first closure member for communicating said pick-up with said first spline connection, said bore having a pair of spaced, parallel circumferential grooves formed therein for defining lubricant pockets from which lubricant is centrifuged during rotation of said coupling, one of said pockets being in communication with said first spline connection and the other of said pockets being in communication with the second of said spline connections, a plurality of inclined holes formed in said opposite end of said inner tubular member to direct lubricant flow through said first and second spline connections into said return path grooves, said outer tubular member including a plurality of circumferentially spaced holes therein in communication with said grooves for defining an outlet therefrom, each of said outlet holes being located at the same end of said outer tubular member as the inlet hole thereto.

3,889,490
TORQUE CONTROL ADAPTOR FOR RATCHET WRENCH

Felix J. Nadolny, P.O. Box 323, Candler, N.C. 28715

Filed May 16, 1974, Ser. No. 470,594
Int. Cl.[2] F16D 3/56
U.S. Cl. 64—29 1 Claim



1. A torque adaptor for a ratchet driven socket wrench comprising, in combination:

a housing having inner and outer cylindrical members threadably joined for selected axial movement, each of said inner and outer members having one end wall and one open end to define an enclosed chamber therebetween, the end wall of said outer member having an opening therethrough and the end wall of the inner member having an outwardly directed non-circular centrally located axial extension output shaft, and a set screw threadably received in an opening in the in the cylindrical wall of said outer member, said set screw being adapted to be tightened against the cylindrical wall of said inner member to selectively fix the axial relationship of said inner and outer members,

a friction disc anchored to the inner surface of the end wall of the inner housing member, said friction disc having a surface of wave form configuration along a peripheral area on the face of the disc which is exposed to said enclosed chamber, said friction disc having an outer diameter substantially equal to the inner diameter of the inner housing member, and said friction disc having a central cup-shaped recess defined therein,

a drive element having a drive disc slidably mounted thereon at one end in abutting relationship with said friction disc and a reduced diameter shaft portion at the opposite end thereof protruding into the opening in the end wall of said outer housing member, the end of said shaft portion which protrudes into the opening in the end wall of the outer housing member having a recess of square cross-section adapted to releasably receive a square shaft on a ratchet driven wrench,

spline means operatively coupling said drive disc and said drive element, said drive disc having a surface of wave form configuration along a peripheral area on the face thereof which abuts the friction disc so that the wave form surfaces on the friction disc and drive disc are in abutting face-to-face relationship,

the end of said drive element adjacent said drive disc having a terminal end sized for bearing reception in the central cup-shaped recess in said friction disc for transmitting axial forces directly between said drive element and said axial extension shaft,

a compression spring surrounding the shaft portion of the drive element in concentric relationship therewith, said compression spring abutting said drive disc at one end and the end wall of said outer housing member at the opposite end to bias said drive disc against said friction disc whereby rotative torque movement applied to said drive element effects corresponding rotative torque movement of the axial extension shaft on the housing until the torque applied to said drive element overcomes the spring compression thereby allowing the drive disc and friction disc to rotate relative to each other,

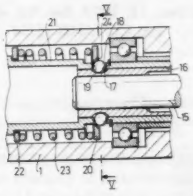
means rotatably securing said drive element terminal end within said friction disc central recess for preventing axial separation of said drive element terminal end from said friction disc while permitting relative rotation therebetween, and

a calibrated scale on a external surface of said outer housing member and a calibrated scale on an external surface of said inner housing member, said calibrated scales being adapted to cooperate in visually displaying the relative relationship of the inner and outer housing members whereby the compression spring can be adjusted selectively to determine the desired rotative torque between said friction disc and said drive disc independently of axial forces applied between said drive element and said axial extension output shaft.

3,889,491
TORQUE-TRANSMITTING SAFETY COUPLING

Karl Wanner, Echterdingen; Hubertus Karl, Bernhausen; Gernot Hansel, Stuttgart-Plieningen; Manfred Bleicher, Leinfelden, and Wolfgang Schmid, Plattenhardt, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed June 26, 1973, Ser. No. 373,666
Claims priority, application Germany, July 6, 1972, 2233130
Int. Cl. F16d 3/56
U.S. Cl. 64—29 13 Claims



1. A torque-transmitting safety coupling, comprising a driven coupling component; a driving coupling component; cooperating coupling portions on said components and so configurated as to be engageable with one another in only a single relative angular position of said components, and to be disengageable in response to the torque transmitted between said components exceeding a predetermined level; and biasing means acting upon said components and urging said coupling portions into engagement.

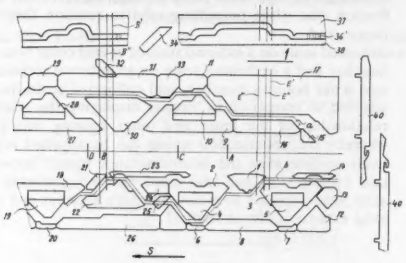
3,889,492
METHOD OF SECURING COURSES ON DOUBLE CYLINDER KNITTING MACHINES

Pavel Zahradka, Trebic; Milan Petranek, Starec, and Jiří Hrábanek, Nova Ves, all of Czechoslovakia, assignors to Elitex, Zavody textilniho strojirenstvi, generalni reditelstvi, Liberec, Czechoslovakia

Filed June 9, 1972, Ser. No. 261,548
Claims priority, application Czechoslovakia, June 14, 1971, 4348-71
Int. Cl. D04b 9/10
U.S. Cl. 66—14 4 Claims

1. A method of knitting on a two cylinder circular knitting machine so as to secure a first yarn which has been caught on the empty needles of a first of said cylinders before and during the laying of a second yarn into the hooks of said needles for the formation of a succeeding course, comprising holding said first yarn on the shafts of said needles during rotation of said cylinders and while said needles are in operative position,

continuing the holding of said first yarn on said needle shafts during the transition from their closing to laying positions below the latches of said needles by means of knocking-over bits held in their rear position, simultaneously catching said



first yarn on the hooks of the needles of the second cylinder which are at such time in their inoperative position, said second yarn then being laid into the hooks of such needles as are in their operative position.

3,889,493

YARN FLOAT CONTROLLER MEANS FOR CIRCULAR KNITTING MACHINES

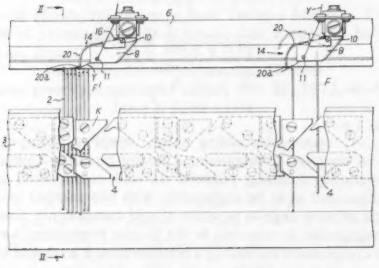
Ernest Leonard Farmer, Leicester, and Osmond Herbert Ecob, Blaby, both of England, assignors to Wildt Mellor Bromley Limited, Leicester, England

Claims priority, application United Kingdom, Jan. 16, 1973, 2169/73

Filed Dec. 11, 1973, Ser. No. 423,787

Int. Cl.[2] D04B *15/54*

U.S. Cl. 66—19 **9 Claims**



1. A multi-feed circular knitting machine of the type comprising a needle cylinder, a cylinder cam box, a needle dial and a dial plate, said machine being set up to produce floated yarn effects in the knitted fabric and wherein there is provided at each feed a stitch cam and at at least some feeds a float controller including an element adapted to be spring loaded in an operative position in which it is so arranged that, in normal working conditions when the needles are knitting, the yarn being knitted runs clear of the said element whereas where the said yarn is missed by the needles the resulting float engages the element in such a way that the required angular relationship between the yarn and the stitch cam at the feed is maintained, characterized in that each said float controller is mounted directly upon a corresponding yarn guide plate secured upon the dial cam plate at its feed and is not itself adapted to funtion as a detector of an electrical stop motion and wherein each said float controller is so pivotally mounted upon its corresponding yarn guide plate as to be readily disengageable therefrom, and spring means are provided between each yarn guide plate and its respective controller for normally holding the latter in its operative position but enabling the controller to safely yield upwardly against the spring influence if it is contacted and displaced by a faulty needle or a slub of yarn.

3,889,494

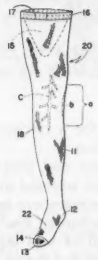
STOCKING WITH COMPENSATED KNEE PRESSURE

Donald Patience, Barrington; Edward G. Hartigan, and Herbert Knohl, both of Schaumberg, all of Ill., assignors to The Kendall Company, Walpole, Mass.

Continuation of Ser. No. 91,799, Nov. 23, 1970, abandoned, which is a division of Ser. No. 293,844, Oct. 2, 1972, abandoned. This application Apr. 12, 1973, Ser. No. 350,533

Int. Cl. D04b *9/52*

U.S. Cl. 66—178 A **6 Claims**



1. In a properly fitted full length stocking including a boot portion, said stocking being of knitted fabric including elastomeric yarn which in said boot portion exerts a compressive pressure on the wearer's leg normally gradually decreasing from the ankle to a point well above the knee,

that improvement wherein

in the knee area the compressive pressure is reduced to provide an area of reduced but still substantial pressure support in the zone including the knee to a level of pressure less than the pressure below the knee area so that a reduced pressure is exerted on the knee area to avoid restricting pressures on the veins in the sensitive popliteal space,

the compressive pressure being increased again above the knee area and thereafter gradually being decreased to the top of the stocking boot.

3,889,495

ROLLER-LOCK

Hans-Ulrich von der Eltz, Frankfurt am Main; Franz Lappe, Hofheim, Taunus, and Albert Reuther, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 4, 1973, Ser. No. 403,647

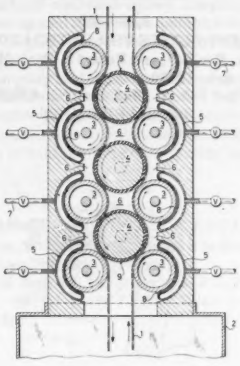
Claims priority, application Germany, Oct. 7, 1972, 2249333

Int. Cl. D06c *1/10*

U.S. Cl. 68—5 E **6 Claims**

6. A sealing device for sealing the common inlet and outlet opening of a high pressure chamber in which textile fabric webs are treated; said device comprising a housing mounted on said chamber in communication therewith and having a series of staged pressure chambers formed therein for providing a graduated pressure drop between one end of the housing adjacent the high pressure chamber and the opposite end of the housing; said housing having a pair of end walls, and said staged pressure chambers being formed between said end walls and a plurality of rollers rotatably mounted therebetween in sealing relation and in contact with each other to form gas and pressure tight nips therebetween to define said staged chambers; said rollers including a series of groups of rollers each of which includes at least one pair of laterally spaced hard rollers, and a roller covered with an elastic mate-

rial positioned between the hard rollers in contact therewith on opposite sides thereby to form pressure tight nips on opposite sides of the elastic covered rollers for respectively engaging fabric moving into and out of said high pressure chamber and for sealing adjacent staged pressure chambers from one another.



3,889,496

PULLEY DRIVE FOR A SIDE-LOADED DRUM TYPE WASHING MACHINE

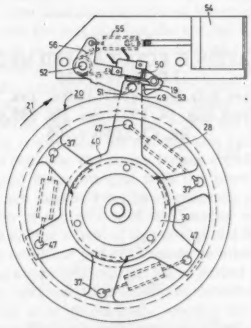
Anton Heyne, Berlin, Germany, assignor to Siemens Electrogerate GmbH, Munich, Germany

Filed Mar. 5, 1974, Ser. No. 448,300

Claims priority, application Germany, Mar. 8, 1973, 2311956

Int. Cl. D06f *37/30*

U.S. Cl. 68—140 **5 Claims**



1. In a drum type washing machine which is loaded through a loading opening provided in the side surface thereof, said drum being mounted on a rotatable shaft within the machine housing and being driven by a drive motor coupled thereto by a pulley belt drive arrangement, and including means for stopping the drum with the loading opening therein aligned with respect to a loading opening provided in the machine housing, an improved pulley drive, comprising:

a first annular pulley part fixed to said drum shaft for coupling said pulley drive arrangement to said drum shaft;

an annular rim, mounted on said first pulley part in concentric disposition with respect thereto, and including a plurality of lug members extending radially outwardly from the periphery thereof;

a second pulley part including a ring-shaped body portion having a radially inner edge adapted for slidable disposal over said rim, and a plurality of radially outwardly extending lug members, including at least one stopping lug member of greater axial length than the others of said lug members, said radially inner edge including a plurality of circumferentially spaced apart recesses disposed in said body portion for receiving said annular rim lug members; and

resilient tension means, coupled to said first and second pulley parts, for absorbing the rotational momentum of the drum during stopping and for aligning said drum and machine housing loading openings subsequent to the stopping of said drum.

3,889,497

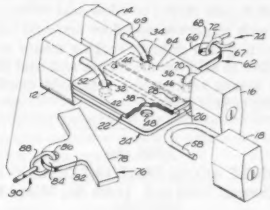
MULTIPLE-LOCK SECURING SYSTEM

Herman L. Tuttle, 12167 San Fernando Rd., Sylmar, Calif. 91342

Filed July 3, 1973, Ser. No. 376,253

Int. Cl. E05b *73/00*

U.S. Cl. 70—14 **1 Claim**



1. A multiple-lock securing system for providing access to a secured area by releasing one of a plurality of locks comprising:

first and second locking plates defining openings therein for positioning said plurality of locks in said openings;

bar means having a base and an arm extending therefrom, said base being positioned adjacent to two of said openings, each of which may receive one of said locks therein, the length of said base being greater than the distance between said openings;

means for interconnecting said first locking plate to said second locking plate comprising an integrally formed member having a pair of bars, one of said bars being secured to said first locking plate, and the other of said bars being secured to said second locking plate; and

means formed on said locking plates for enabling said bars to be fastened to said locking plates when said locks are positioned in said openings and removed therefrom when one of said locks is removed from its respective opening.

3,889,498

KICK-PROOF ACCESS CONTROL HANDLE

Bob G. Harrell, St. Louis, Mo., assignor to Jackes-Evans Manufacturing Company, St. Louis, Mo.

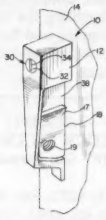
Filed July 14, 1972, Ser. No. 271,648

Int. Cl. E05b *65/44*

U.S. Cl. 70—78 **8 Claims**

1. A locker assembly including a frame, a door mounted on said frame, a kick-proof handle means mounted on said door, latching means for cooperative engagement with a catch means on said locker assembly to maintain said door in a latched condition when said door is in a closed position, obstructing means carried in said handle means, primary locking means cooperating with said obstructing means and being operative to prevent movement of said latching means relative to said handle and said door and thereby prevent release of

said latching means from engagement with said catch means and prevent opening of said door, and access locking means carried on said locker assembly, said access locking means including means to bypass said primary locking means to allow said obstructing means and said latching means to be moved relative to said handle means and said door when said primary locking means is in locked condition thereby to disengage said latching means from said catch means to permit opening of



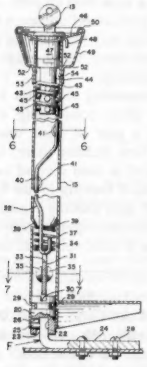
said door, said means to bypass said primary locking means including means mounted in said handle means and movable relative to said handle means to allow said obstructing means to be moved with respect to said door and said handle means thereby permitting said primary locking means to be moved unitarily relative to said handle means and said door to shift said latching means cooperating with said catch means to permit opening of said door.

3,889,499

AUTOMOBILE ACCELERATOR LOCKING DEVICE

William H. Cramer, 1598 N.E. 104th St., Miami Shores, Fla. 33138

Filed Nov. 1, 1974, Ser. No. 520,110
Int. Cl.² B60R *25/04*
U.S. Cl. 70—202 **4 Claims**



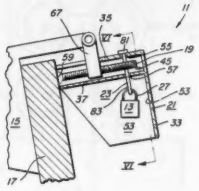
1. An automobile accelerator locking device comprising a tubular member, a foot member rotatably mounted at one end of said tubular member and adapted to be fastened to the floor of an automobile beneath the accelerator, an accelerator locking member secured to said one end of said tubular member adjacent said foot member, handle means mounted at the other end of said tubular member, a key operated lock device mounted at said other end of said tubular member and interconnecting means extending between said lock device and said foot member whereby upon swinging said locking member to a position beneath the accelerator and locking said lock device said inter-connecting means is actuated to connect said handle means and said foot member to prevent the operation of said accelerator.

3,889,500

ANTI-THEFT DEVICE FOR OUTBOARD MOTORS

Donald E. Hix, Box 547, and Robert S. Dyer, Hays St., both of Clarendon, Ark. 72029

Filed Feb. 5, 1974, Ser. No. 439,707
Int. Cl.² F16B *41/00*
U.S. Cl. 70—232 **9 Claims**



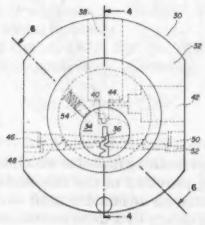
1. In combination with an outboard motor having clamp means for removably attaching said motor to a boat, and a padlock for securing said motor to said boat, the improvement which comprises anti-theft means engaging said clamp means and said padlock for preventing unwarranted removal of said motor from said boat, said anti-theft means including boxlike means disposed about said padlock for providing a barrier against access to said padlock by a tamperer, and locking means slidably and removably engaging said boxlike means and said clamp means for shackling said boxlike means to said clamp means, said locking means being provided with a hole for receiving the shackle of said padlock, said boxlike means including a first compartment for enveloping at least a portion of said clamp means thus denying tampering access thereto and including a second compartment for enveloping said padlock thus denying tampering access thereto.

3,889,501

COMBINATION ELECTRICAL AND MECHANICAL LOCK SYSTEM

Charles P. Fort, P.O. Box 38547, Dallas, Tex. 75238

Filed Aug. 14, 1973, Ser. No. 388,094
Int. Cl. E05b *47/06*
U.S. Cl. 70—283 **11 Claims**



1. A lock system comprising:
a lock having a lock cylinder and a key slug rotatable within said cylinder,
a pin contacting a surface on said key slug for normally preventing said lock from being opened,
electrical means adapted for movement of said pin,
a key having first and second series of discrete coded portions formed therein, said first series being laterally offset relative to said second series,

means in said lock, for detecting the passage of said coded portions upon insertion of said key and for generating first and second electrical signals in response thereto,

said first electrical signals comprising a series of data pulses spaced apart according to a predetermined configuration and said second electrical signals comprising a series of clock pulses spaced apart by a common interval, one edge of said clock pulses occurring concurrently with ones of said data pulses,

means for sampling said data pulses in response to said one edge of said clock pulses, and

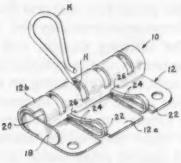
means responsive to a predetermined sampled sequence of said data pulses for activating said electrical means for movement of said pin to permit opening said lock.

3,889,502

KEY HANGER SUPPORT FOR KEY CASES

James B. Kruger, Oxford, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Aug. 29, 1973, Ser. No. 392,490
Int. Cl.² A44B *15/00; 150/40*
U.S. Cl. 70—456 **1 Claim**



1. A key hanger support for key cases which comprises a plate member having an edge portion bent to form a tube, the tube having longitudinally spaced notches at the extreme of said edge, said tube being provided with at least one transverse hanger-retaining slot terminating in an enlarged opening, a portion of said opening being offset from the slot, a locking member slidably mounted in the tube and having a projection positioned to close that portion only of the opening which is in alignment with the slot and bar the entrance from the slot to the opening in one position of the locking member and to clear said opening and its entrance in a second position of the locking member, a spring means normally holding said locking member in said first position, a finger piece carried by the locking member at that end toward which the offset portion of said opening is directed, for moving said locking member to said second position, the spring means including a pair of spaced U-shaped strips integral with the plate and locking member and each disposed in planes generally perpendicular to the direction of movement of the locking member, each U-shaped strip having a pair of legs connected by a bight and one of the legs being cut out of the plate member, the cut-out being ample on either side of each leg to permit lateral movement of the leg, and said other legs being received through the notches into the tube respectively whereat the ends of the other legs remote from the bight are connected to the locking member.

3,889,503

SAFETY INDICATOR SYSTEM AND METHOD FOR METAL FORMING MACHINES

Kurt K. Luenser, De Soto, Tex., assignor to Verson Allsteel Press Company, Dallas, Tex.

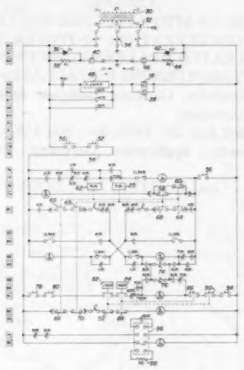
Filed July 1, 1974, Ser. No. 484,670
Int. Cl.² B21J *9/20*
U.S. Cl. 72—6 **17 Claims**

1. A safety system for a press having a plurality of start switches comprising:

indicator means having first, second and third states,

means for placing said indicator means in said first state when the press is ready to be energized,

means responsive to actuation of one of the start switches for placing said indicator means in said second state for a predetermined time interval, and



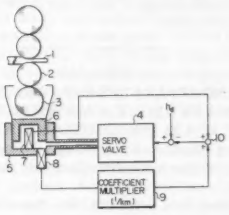
means responsive to the actuation of the remainder of the start switches during said predetermined time interval for placing said indicator means in said first state to indicate operation of the press.

3,889,504

THICKNESS CONTROL DEVICE FOR ROLLING MILL

Ken Ichiryu, Mito; Masayuki Shigeta, Katsuta, and Toshiyuki Kajiwara, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 9, 1974, Ser. No. 496,209
Claims priority, application Japan, Aug. 22, 1973, 48-93342
Int. Cl. B21b *37/02*
U.S. Cl. 72—8 **4 Claims**



1. In a gagemeter type automatic thickness control system in a rolling mill consisting of rolls for rolling a strip, hydraulic jack for imparting a rolling pressure to said rolls, a flow rate control valve for adjusting a roll gap by adjusting the amount of oil in said hydraulic jack, a valve control device, a setting device for feeding a desired thickness command to said control device, and a position detector for detecting the roll gap and feeding back the detected value to said valve control device; a thickness control device, comprising

means for detecting an input side thickness and an output side thickness of said strip;

a computing device for obtaining the respective power spectra $\phi h1$, $\phi h2$, $\phi h3$ from the autocorrelation functions $Rh1$ and $Rh2$ and the cross-correlation function $Rh1h2$ and then for obtaining from said power spectra the roll

eccentricity based on the coherence defined by ($\phi^2 h1\ h2)/\phi h1 \cdot \phi h2$); and

means for feeding as a command value the roll eccentricity obtained from said computing device, to said plate thickness control device.

3,889,505

PROCESS AND AN APPARATUS FOR REGULATING THE DRIVE OR DECELERATION OF POWER DRIVEN OR DECELERATED ROLLERS IN DRAWING AND STRAIGHTENING INSTALLATIONS

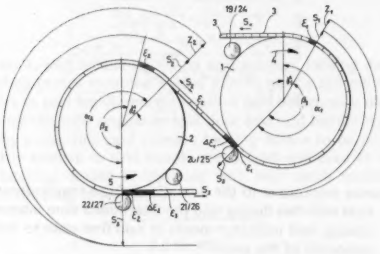
Josef Ihle, Pforzheim, Germany, assignor to Irma Ungerer, Pforzheim, Germany

Filed Jan. 28, 1974, Ser. No. 436,920

Claims priority, application Germany, Feb. 7, 1973, 2305777

Int. Cl. B21b *37/06, 39/08*

U.S. Cl. 72—17 **6 Claims**



1. A process for regulating the drive or deceleration of power driven or decelerated rollers in installations in which a strip of material, preferably a metal strip, is passed across a plurality of rollers under a stretching tension, more particularly in drawing and straightening installations, comprising the steps of: measuring the variation in elongation to which the strip is subjected during its passage across a single roller; electrically comparing the variation in elongation with preset nominal values; and utilizing the result of the comparison for the electrical influencing of the power drive or deceleration of at least this one roller.

3,889,506

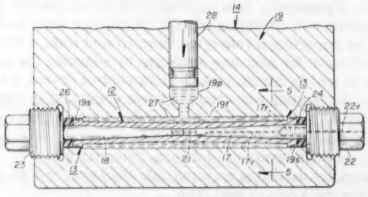
METHOD AND APPARATUS FOR FORMING A TUBULAR BILLET ABOUT A MANDREL USING MULTI-DIRECTIONAL STRESS

John Richard Shaffer, Ewing Twp., Mercer County, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Mar. 25, 1974, Ser. No. 454,648

Int. Cl. B21d *26/02*

U.S. Cl. 72—60 **11 Claims**



1. A method of forming a tubular metal member to a configuration in which internal and external surfaces of the member are concave inward as viewed in longitudinal section and at least the internal surfaces are symmetrical on opposite sides of the transverse centerline of the member, which comprises:

forming a tubular metal billet having an external surface of uniform diameter and an internal surface of uniform diameter;

forming the tubular metal billet with substantially identical temporary integral end flanges having an external diameter greater than the external diameter of the billet between the end flanges and substantially corresponding to a diameter of cylindrical interior surfaces of a hydrostatic forming device, and having opposed annular bearing surfaces intersecting the external surface of the billet to provide hydrostatic seals at their respective intersections and of sufficient cross-sectional area such that when the bearing surfaces and the peripheral portion of the billet therebetween subsequently are subjected to hydrostatic pressure in a forming operation, the end flanges are retained against any substantial inward longitudinal movement and the billet is stressed longitudinally in tension;

forming each temporary integral end flange of the tubular billet with a circumferential seal-receiving portion;

positioning annular hydrostatic seals in engagement with the circumferential seal-receiving portions;

positioning the tubular billet in the hydrostatic forming device with the temporary integral end flanges confined against transverse movement by the cylindrical interior surfaces of the forming device, and with the seals in sealing engagement with the cylindrical interior surfaces;

positioning a split mandrel having an external configuration conforming to the desired internal concave configuration of the tubular member, within the tubular billet with opposed inner ends of the mandrel in aligned engagement and spaced relationship to the interior of the billet;

subjecting the opposite outer ends of the split mandrel to opposing forces to preclude longitudinal movement of the mandrel and separation of the engaged inner ends of the mandrel during the forming of the billet inwardly about the mandrel;

simultaneously applying hydrostatic pressure to the opposed annular bearing surfaces of the temporary integral end flanges and to the peripheral portion of the tubular billet therebetween, to retain the end flanges against any substantial inward longitudinal movement and to stress the billet longitudinally in tension, while compressively stressing the billet inward into inwardly concave symmetrical engagement with the mandrel; and

removing selected portions of the temporary integral end flanges not required in the tubular metal member after the stress-forming of the billet.

3,889,507

APPARATUS FOR COOLING A STEEL MEMBER WHILE BEING ROLLED ON A CONTINUOUS HOT-ROLLING MILL

Helmut Kranenberg, and Michael Sawitz, both of Bethlehem, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Nov. 15, 1973, Ser. No. 416,310

Int. Cl. B21b *45/02*

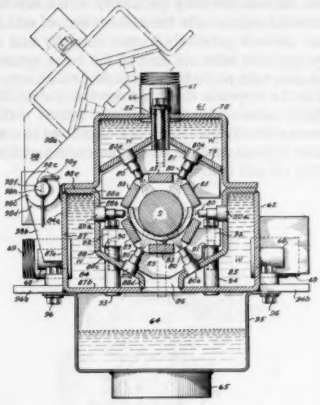
U.S. Cl. 72—201 **8 Claims**

1. In a continuous hot-rolling mill having a plurality of roll stands for advancing a solid steel workpiece in a predetermined substantially horizontal pass line, the improvement comprising:

a. at least one spray unit comprising a pair of spaced coolant spray chambers, aligned longitudinally in tandem, positioned between two of said roll stands in said mill and surrounding a portion of said pass line,

b. a plurality of spray means in each of said spray chambers for spraying water onto the surface of said steel workpiece as said steel workpiece is advancing along said pass line, and

c. elongated guard means in each of said spray chambers to guard said spray means from contact with said steel workpiece said guard means in each of said spray chambers comprising a plurality of spaced elongated metallic bars



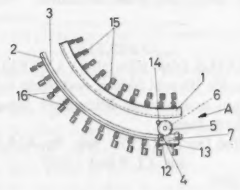
generally rectangular in cross section extending longitudinally substantially the length of each of said spray chambers, the space between said guard means providing access for spray water from said spray means to impinge on the surface of said advancing steel workpiece.

3,889,508

POLE BENDING APPARATUS

Toshio Sugita, Sakura, Japan, assignor to Sanyu Kosan Kabushiki Kaisha, Chiba, Japan

Filed June 10, 1974, Ser. No. 477,570
Claims priority, application Japan, June 25, 1973, 48-70799
Int. Cl. B21d *7/02*
U.S. Cl. 72—215 **4 Claims**



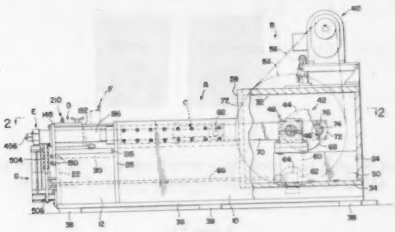
1. Pole bending apparatus comprising an inner guide member having a concave groove along its outer face and forming an elongated curve to which a pipe is to be bent, an outer rail member formed into a curve spaced from and paralleling that of the guide member and having a rack extending along its length, a movable truck member mounted on the outer rail member and having gear means engaging the rack on the rail member, a bending roller mounted on the truck and having a concave groove facing the concave groove on the inner guide member and forming therewith an approximately round opening for receiving and clamping the pipe to be bent, and means for driving the truck gear means causing the truck to move along the rail member whereby a pipe inserted into the round opening is bent into a curve conforming to that of the inner guide member.

3,889,509

HORIZONTAL CAN IRONING PRESS

Stanley J. Miller, and Bernard Hook, both of Hastings, Mich., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Apr. 8, 1974, Ser. No. 458,392
Int. Cl. B21d *22/30*
U.S. Cl. 72—349 **27 Claims**



1. In a machine for forming a can body having a closed end and a peripheral side wall extending therefrom and which machine includes a frame, punch means supported by said frame for reciprocation between first and second positions along a linear path, ironing ring means coaxial with said punch means and supported by said frame between said first and second positions, said punch means receiving a can blank in said first position and being cooperable with said ironing ring means to form said blank upon movement of said punch means to said second position, and means to reciprocate said punch means between said first and second positions, the improvement comprising: said punch means including slide means reciprocable along said path, said slide means having spaced apart horizontally parallel sides, opposed guide channel means on said frame receiving a corresponding one of said slide sides, each said guide channel means including horizontally extending vertically spaced parallel planar guide surfaces and a vertically extending planar guide surface therebetween and perpendicular thereto, each of said slide sides including corresponding follower surfaces slidably engaging said horizontally and vertically extending guide surfaces, said slide sides each including bar means having first and second end portions, said follower surfaces being on said first end portions, each said guide channel means having an end in the direction from said first position toward said second position, said second end portions of said bar means extending from said first end portions in said dirsction, and apertured bearing means fixed relative to said frame adjacent said ends of said guide channel means receiving and slidably supporting said second end portions of said bar means.

3,889,510

HOT FORGING PROCESS

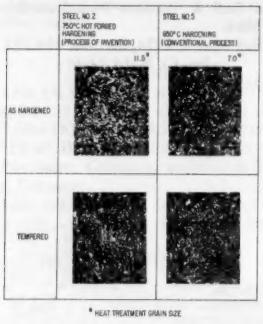
Noboru Yamakoshi; Toshihiro Minami, and Sinitiro Somekawa, all of Kobe, Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Nov. 8, 1973, Ser. No. 413,759
Claims priority, application Japan, Nov. 8, 1972, 47-111944
Int. Cl. B21j *1/06*
U.S. Cl. 72—364 **5 Claims**

1. A process of hot forging a carbon or low alloy steel, which comprises the steps of:

working a steel;

hardening said worked steel at a temperature of at least the Ac_1 transformation point of the steel; and



hot forging said steel at a temperature in the range from 450°C to the Ac_1 transformation point of the steel.

3,889,511

METHOD OF MAKING A CONTROLLED TORQUE CONNECTING MEMBER

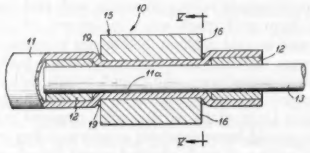
Robert Vincent Bayle, Ecquevilly, France, assignor to Gemmer-France, France

Filed Mar. 2, 1973, Ser. No. 337,721

Claims priority, application France, Mar. 15, 1972, 72.09039

Int. Cl. B21k *21/08*

U.S. Cl. 72—370 **9 Claims**



1. The method of making a connection member for controlled torque assembly with an inserted member which comprises inserting a mandrel in a tube of greater diameter than the mandrel, concentrically spacing the tube around the mandrel, radially contracting at least a portion of the length of the tube into the space between the the tube and mandrel to engage the tube substantially continuously around the mandrel, simultaneously raising circumferentially spaced outturned radial closed folds of tube material along the length of the contracting portion, shaping the interior of the contracted portion into conformity with the outer periphery of the mandrel, and withdrawing the mandrel.

3,889,512

STEERING KNUCKLES AND METHOD OF FORMING THE SAME

Ralph D. Delio, 4615 Holland Sylvania Rd, Toledo, Ohio 43620

Filed Mar. 13, 1974, Ser. No. 450,731

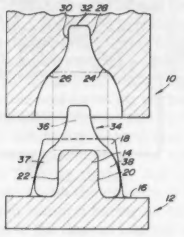
Int. Cl. B21k *1/74*

U.S. Cl. 72—377 **2 Claims**

1. A method of press forging steering knuckles comprising the procedural combination of steps of:

orienting one end of a heated elongated steel billet adjacent a narrow tapered central web portion projecting from a base of a first one of a first pair of dies such that said billet extends laterally beyond each side of said web over pockets defined by each of the sides of said web, said base and generally transverse walls at either end of said web, said one end extending generally parallel to said base;

pressing said billet axially in a direction generally perpendicular to said one end and said base by means of shallower surfaces defining the cavity of the second mating die of said pair to split the end portion of said billet and cause the web relatively to move axially and longitudinally into said billet as steel of the billet simultaneously flows into said pockets and to said base in one direction and in the opposite direction toward and to the deeper surfaces defining the cavity of said second mating die to form a saddle-shaped blank having one leg in each pocket and an oppositely extending boss ending at the deepest surface of said mating die;



removing the saddle-shaped blank from said first pair of dies and orienting said blank on its side in one die of a second pair of mating dies;

pressing said blank in said second set of mating dies in a direction normal to said first axial pressing to block out said steering knuckle and to move excess steel laterally to form a surrounding integral flashing;

removing said blocked out steering knuckle from said second set of dies and orienting it on its side in one die of at least a third pair of mating dies which define a cavity substantially the shape and dimension of the desired finished steering knuckle forging;

pressing said third set of dies together to press forge the blocked out steering knuckle to proper size;

removing from the forging any flashing remaining and thereby providing a steering knuckle forging of the desired size, shape and grain structure.

3,889,513

APPARATUS FOR BENDING A STEEL PLATE

Yasuhiro Iwasaki; Hiroshi Shiota, and Seido Seko, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 26, 1973, Ser. No. 428,302

Int. Cl. B21d *13/02*

U.S. Cl. 72—385 **10 Claims**

1. Apparatus for bending a steel plate to provide complex curvature thereof, comprising:

means for intermittantly advancing a steel plate along a longitudinal path through a bending station;

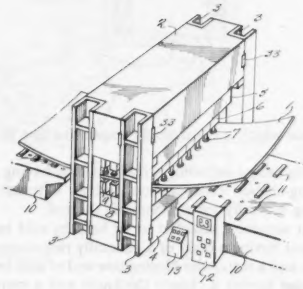
a first punch group including a plurality of individual punches disposed of in at least three longitudinally spaced, transversally extending rows at the bending station, all of the punches in the first punch group being oriented for contact with one face of the steel plate to be bent;

a second punch group including a plurality of individual punches disposed in at least three longitudinally spaced, transversally extending rows at the bending station, all of the punches in the second punch group being oriented for contact with the opposite face of the steel plate to be bent, in direct opposition to corresponding ones of the punches in the first punch group;

frame means and means mounting the first and second punch group on the frame means at the bending station; the mounting means for at least one of the two recited punch groups including an adjustment device between each punch and the frame means, and remotely operable control means for operating each adjustment device to change the proximity of each individual punch to the path of the steel plate through the bending station;

the mounting means for at least the other of the two recited punch groups including means for advancing each punch of said other punch group this is within the width of the increment of the steel plate that is within the bending station into such forceful contact with that increment that said increment is engaged by punches of the one punch group on a first face thereof and by punches of the other punch group on the second face thereof, in opposed pairs, separated by the thickness of the steel plate; and means for retracting the punches of said other punch group once the steel plate of that increment has been bent by said forceful contact,

whereby, the steel plates may be intermittantly advanced by an increment and progressively bent by increments, with the control means being operated to change the proximity of the individual punches of the first punch group to the path of the steel plate through the bending station between each bending operation of the two recited punch groups in which the curvature planned for the next increment of the steel plate to be bent differs from the curvature applied to the steel plate increment just bent.



3,889,514

SWAGING MACHINE

Bruno Kralowetz, and Gottfried Blaimschein, both of Steyr, Austria, assignors to GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Aktiengesellschaft, Steyr, Austria

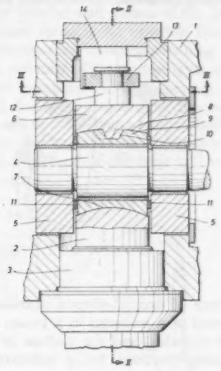
Filed Dec. 28, 1973, Ser. No. 429,689

Claims priority, application Austria, Oct. 10, 1973, 176/73

Int. Cl. B21j *7/16, 7/20*

U.S. Cl. 72—402 **3 Claims**

1. In a swaging machine which comprises means defining a path of travel for a workpiece to be fed in the direction of the path and to be swaged, a plurality of hammers, and drive means operable to impart to the hammers a reciprocating motion toward and away from the path for swaging said workpiece and an oscillating motion for feeding said workpiece, the improvement of the drive means being arranged to impart to the hammers an oscillating motion in a plane which extends transversely to the direction of the path of travel.



3,889,515

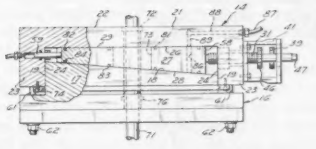
WEDGING STRUCTURE FOR PRESSES OR THE LIKE

Walter J. Grombka, Tiffin, Ohio, assignor to The National Machinery Company, Tiffin, Ohio

Filed July 22, 1974, Ser. No. 490,270

Int. Cl. B21j *13/02*

U.S. Cl. 72—448 **17 Claims**



1. A press or the like comprising a frame providing a die bed, a slide reciprocable in said frame toward and away from said die bed, and a wedge system on said die bed operable to adjustably position stationary dies in said press, said wedge system including a laterally movable wedge formed with a locking taper, and hydraulic means operable to supply a liquid under pressure to the interface between said wedge and the mating surfaces of said wedge system with sufficient pressure to release said wedge for lateral movement even when said slide is jammed in a dead center position.

3,889,516

HARDENING COATING FOR THREAD ROLLING DIES

Herbert L. Yankee, North Royalton, and Robert J. Hlavaty, Avon Lake, both of Ohio, assignors to Colt Industries Operating Corp., W. Hartford, Conn.

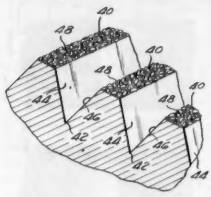
Filed Dec. 3, 1973, Ser. No. 421,055

Int. Cl. B21d *17/00*

U.S. Cl. 72—469 **5 Claims**

1. A thread rolling die for use with a corresponding thread rolling die in forming a threaded screw from a blank, said die including thread-forming means comprising a tool steel body

formed with a projecting flattened thread root-forming portion, a recessed thread crest-forming portion, and thread side-forming portions joining the root and crest-forming portions, said projecting flattened root-forming portion having a



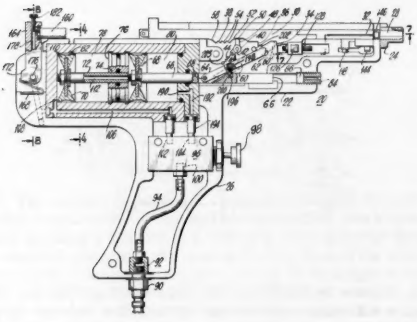
nodularized surface of droplet-shaped nodules in which the nodules are formed of a material in a group including hard metal and metal carbides, and the surface of said crest and thread side-forming portions being substantially free of nodularized surface.

3,889,517

EXTRUSION TOOL

Daniel Eppler, Old Bridge, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Sept. 23, 1974, Ser. No. 508,035
Int. Cl.[2] B21C *33/00*; B21D *39/04*
U.S. Cl. 72—270 **24 Claims**



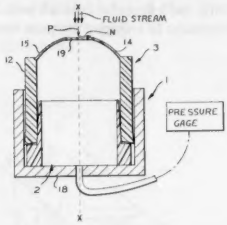
1. An extrusion tool comprising: a tool body having a nose portion and a grip portion; plunger means reciprocatingly movable in said tool body and having a first end movable towards and away from said nose portion; pneumatic drive means located within said tool body for selectively moving said plunger means towards said nose portion; cam means selectively coupling said drive means to said plunger means in one direction to provide stepped movement of said plunger means towards said nose portion; an inlet located in said grip portion for coupling a source of pneumatic pressure thereto; and valve means located in said grip portion for selectively directing a source of pneumatic pressure from said inlet to said drive means to control the direction of movement of said drive means; said nose portion having a tapered orifice extending therethrough, said orifice being arranged to receive said plunger means first end therein for extruding a workpiece therethrough.

3,889,518

DEVICE FOR CONSISTENT RESPONSE TO A FLUID PULSE AND METHOD AND APPARATUS FOR VERIFYING INSTRUMENTS UTILIZING FLUID PULSES

Pieter J. Denouter, Marlboro, and Bernard Grolman, Worcester, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Dec. 26, 1973, Ser. No. 428,477
Int. Cl.[2] G01L *27/00*
U.S. Cl. 73—4 R **11 Claims**



1. A device which is consistently responsive to a fluid pulse comprising:

a mounting means including a resilient base having a generally ring-shaped cross-section and an external surface tapering inwardly toward one end thereof,

a resilient simulator adapted to be held by said base, said simulator having a body of a generally ring-shaped cross-section and a responder closing one end of said body, said responder having a chosen thickness and a convex substantially spherical exterior surface, said body having an internal diameter less than the maximum diameter of said external surface of the base,

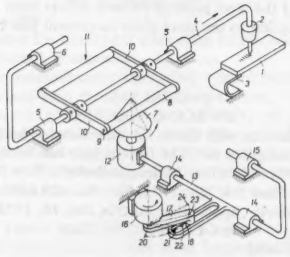
said simulator being mounted with the tapering external surface of said base at least partially within the other end of said body, said external tapering surface having a taper chosen to provide sufficient frictional engagement to hold said simulator such that said responder flexes in a consistent manner under the pressure of a fluid pulse applied to the surface thereo. thereof.

3,889,519

METHOD AND APPARATUS FOR TESTING THE FUSION WELDABILITY OF METALLIC MATERIALS

Josef Nemec, Prague, Czechoslovakia, assignor to Ceske vysoke uceni technicke, Prague, Czechoslovakia

Filed July 9, 1973, Ser. No. 377,416
Int. Cl. G01h *25/72*
U.S. Cl. 73—15 R **8 Claims**



1. A method testing the weldability of metallic materials based on the criterion of hot cracking tendency in the process of welding, comprising employing a test body with a smooth

surface with no joints to be welded, melting the test body during the test by means of a heat source in such a way as to form a weld bead, and intentionally changing the welding speed during the formation of the weld bead while maintaining the heat output of the heat source unchanged examing the thus-formed weld bead for cracking.

3,889,520
FLUIDIC SYSTEM FOR MONITORING MACHINE TOOL WEAR DURING A MACHINING OPERATION

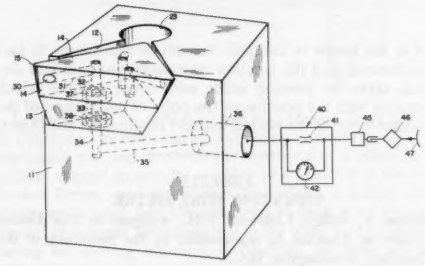
Theodor Stoferle, Weinbergstrasse 29, D-6101, Seeheim, and Bernhard Bellmann, Moselstrasse 7, D-6102, Pfungstadt, both of Germany

Filed Aug. 8, 1973, Ser. No. 386,783

Claims priority, application Germany, Feb. 13, 1973, 2307046

Int. Cl. G01b *13/12*

U.S. Cl. 73—37.5 **17 Claims**



1. In a machining apparatus of the type including machine tool operable to perform a machining operation on a workpiece, the improvement of a system for monitoring relative movement of the tool toward and away from the workpiece, comprising:

a. a fluid supply system including:

i. a fluid nozzle formed in the tool for movement therewith relatively toward and away from the workpiece;

ii. conduit means communicating with said nozzle and adapted for connection to a source of pressurized fluid for supplying fluid under pressure to said nozzle; and,

b. pressure monitoring means communicating with said fluid supply system for sensing changes in fluid pressure as an indication in changes in the distance between said nozzle and the workpiece.

3,889,521
STATIC GAS PRESSURE MEASURING DEVICE

Christopher C. Jakimowicz, Detroit, Mich., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed May 15, 1974, Ser. No. 470,117

Int. Cl. G01n *15/08*

U.S. Cl. 73—38 **7 Claims**

1. An apparatus for measuring the permeability of a porous layer of material comprising

a. conduit means having two open ends,

gas pressure measuring means connected to one open end of the conduit means,

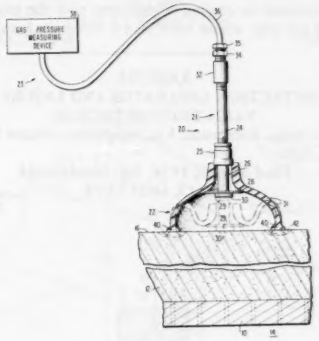
c. chamber means having imperforate wall means, the chamber means being carried by and in gas-tight connection with the conduit means,

d. margins on the wall means forming a large opening into the chamber means, the large opening being spaced from the chamber means connection with the conduit means,

e. the margins of the wall means forming the opening in the chamber means having a continuous edge completely surrounding the opening, the continuous edge throughout its entire length lying in a single plane,

f. porous layer contacting means having tubular wall means carried by the conduit means and in gas-tight connection with the other open end of the conduit means, the porous layer contacting means projecting into the chamber,

g. margins on tubular wall means of the porous layer contacting means forming an opening facing in the same general direction as the large opening in the chamber means, the opening of the porous layer contacting means being small compared to the opening of the chamber means and the edge surrounding the porous layer contacting means opening being spaced inwardly of the edge surrounding the chamber means opening in a direction away from the plane of the edge of the opening of the chamber means,



h. the margins on the wall means forming the opening in the porous layer contacting means having a continuous edge completely surrounding the opening, the continuous edge throughout its entire length lying in a single plane, and

i. means acting between the margins of the wall means of the chamber means and the margins of the wall means of the conduit means providing for relative movement of the edge of the opening of the porous layer contacting means toward the edge of the opening of the chamber means to bring the edge of the opening of the chamber means and the edge of the opening of the porous layer contacting means into simultaneous contact with the surface of a porous layer of material for measuring the permeability thereof with the edges of the two openings approximately concentric and each of the edges of the two openings in continuous contact with the surface of the porous layer throughout the entire length of the edge.

3,889,522
PIPELINE CONDITION ANALYZER

Kenneth E. Mayo, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Aug. 21, 1972, Ser. No. 282,318

Int. Cl. G01m *3/08*

U.S. Cl. 73—40.5 R **6 Claims**

1. A pipeline condition analyzer comprising

A. pigging apparatus for isolating a segment of pipe as it moves through the pipe,

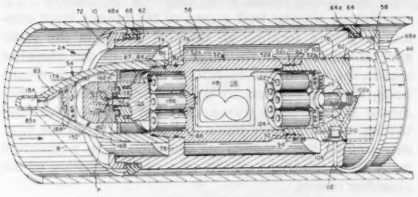
B. a pressure detector on board the pig for sending the pressure in the isolated pipe segment and developing an electrical signal proportional thereto,

C. and means on board the pig for continuously recording the pressure signal on a recording medium so as to develop a pressure profile for the pipeline,

D. said pigging apparatus including

1. a capsule containing the pressure detector and recorder and whose cross section is smaller than the smallest pipe whose condition is to be analyzed, and

2. a removable sleeve encircling the capsule, the opposite ends of the sleeve having outwardly projecting seals



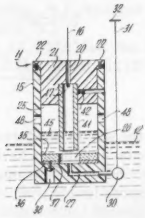
arranged for sealing engagement with the interior wall of the pipe whose condition is to be analyzed.

3,889,523

LEAK-DETECTION APPARATUS AND LIQUID LEVEL VARIATIONS DETECTOR

David G. Nolte, Richmond, Va., assignor to Texaco Inc., New York, N.Y.

Filed Mar. 8, 1974, Ser. No. 449,414
Int. Cl. G01f *23/28*
U.S. Cl. 73—49.2 **13 Claims**



1. Liquid level variation detector, comprising in combination

submerged means for transmitting acoustic energy into said liquid,

signal-transducer means immersed in said liquid a variable amount depending upon the said liquid level,

said transducer means having a geometric configuration for producing a resonant condition at a predetermined amount of immersion, and

electric circuit means including said transducer means for indicating said liquid level variation.

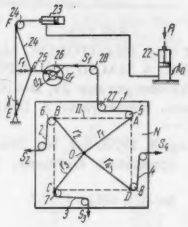
3,889,524

ARRANGEMENT FOR CHECKING STABILITY OF SELF-SUPPORTED OBJECTS

Mikhail Fedorovich Glushko, prospekt Shevchenko, 15/5, kv. 17; Mikhail Pavlovich Nikitinsky, ulitsa Perekopskoi Divizii, 14a, kv. 48; Ilya Fedorovich Pakhomov, ulitsa Lenina, 44/46, kv. 55, and Oleg Fedorovich Kurgansky, prospekt Shevchenko, 10, kv. 30, all of Odessa, U.S.S.R.

Filed Feb. 1, 1974, Ser. No. 438,777
Int. Cl. G01m *1/00*
U.S. Cl. 73—65 **9 Claims**

1. An arrangement for checking stability of a self-supported object having sensors of the values of normal support reactions of the object, comprising, in combination: guide members mounted at the vertexes of a master contour which is geometrically similar to a support contour of the object formed by the lines interconnecting its support points; pull elements extending through said guide members, one end of each pull element being connected to the corresponding ends of the other pull elements inside the master contour so as to form a freely displaceable junction; transducers, each being connected to one of said sensors and to the other end of the respective pull element, whereby a moment, which is directly proportional to the value of the respective support reaction



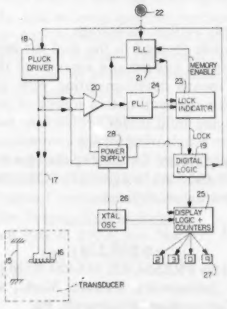
and to the length of said pull element, is transmitted to said pull element, and the junction interconnecting said pull elements takes the position inside said master contour which coincides with the position of the point of application of the resultant force of the normal support reactions of the object.

3,889,525

VIBRATING WIRE METER

William V. Bailey, Lebanon, N.H., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Aug. 7, 1974, Ser. No. 495,347
Int. Cl. G01l *1/10*
U.S. Cl. 73—67.2 **13 Claims**



10. A device for measuring the natural frequency of a wire under tension comprising:

means for magnetically plucking said wire;

means for detecting mechanical vibration of said wire;

a phase lock loop circuit connected to said vibration detecting means for tracking mechanical vibration in a given frequency band about a selected frequency;

a voltage controlled oscillator;

means connected to said voltage controlled oscillator for connecting said voltage controlled oscillator to said plucking means during a first period and for connecting said voltage controlled oscillator to said phase lock loop circuit for tracking during a second period; and

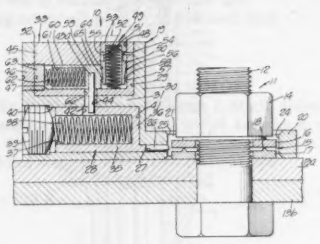
means connected to said voltage controlled oscillator for indicating the tracked frequency.

3,889,526

MECHANISM FOR INDICATING LOAD TENSION ON A FASTENING DEVICE

Edwin C. Elsner, deceased, late of Kanosh, Utah, and Viola Hazel Elsner, executrix, Kanosh, Utah, assignors to Max Fink and Floyd G. Hahn, both of Beverly Hills, Calif., part interest to each

Filed Oct. 23, 1973, Ser. No. 408,399
Int. Cl. G01d *21/00*; G01b *5/08*
U.S. Cl. 73—88 F 15 Claims



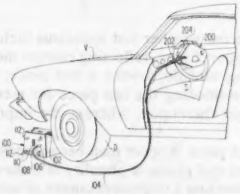
1. Mechanism for indicating the load tension force applied to a threaded member during tightening and setting up of an associated nut, and in which the load tension is effective to radially expand an annular member as a function of the load tension forces, said mechanism comprising a hollow body having an integral, laterally extending projection on one side thereof of reduced height relative to the body, said projection having an opening therethrough defining an inner annular wall, said opening having a size such as to receive the nut and the annular member therein and the height of the projection being such that at least a portion of the nut received in said opening is exposed above said projection for engagement with a suitable tool, sensing means in said hollow body including a movable elongate sensing member extending through an opening in said wall into said opening at one side of said annular member and engagable by and axially movable in response to radial expansion of the annular member, and visual indicating means carried by said body and operatively connected with said sensing member to be activated in response to movement of said sensing member.

3,889,527

STEERING LINKAGE TESTING APPARATUS

Virgil T. Wallace, Box 831, Gladewater, Tex. 75647

Filed Apr. 4, 1974, Ser. No. 458,057
Int. Cl. G01m *17/06*
U.S. Cl. 73—118 17 Claims



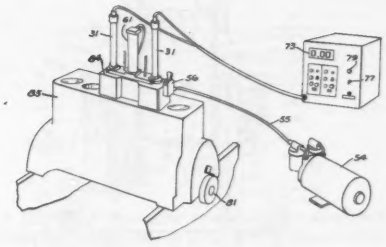
1. Apparatus for use in testing play in the mechanism connecting the steering wheel and the steerable road wheels of a vehicle, comprising a support to be disposed on the road wheel supporting surface adjacent one of the road wheels, sensing means movably supported by said support and engagable with the respective road wheel for sensing movement by the wheel, circuit means in said support responsive to said sensing means for producing a signal, steering wheel movement indicating means mountable at least on the steering wheel for indicating steering wheel travel, and indicator means on said steering wheel movement indicating means connected to said circuit means for generating an alarm in response to said signal upon initial movement of said sensing means by the road wheel.

3,889,528

METHOD AND APPARATUS FOR DETERMINING TOP DEAD CENTER IN INTERNAL COMBUSTION ENGINES

Henry W. Grikscheit, Bloomfield Hills, and Vernon G. Converse, III, Franklin, both of Mich., assignors to Scans Associates, Inc., Livonia, Mich.

Continuation-in-part of Ser. No. 252,594, May 12, 1972, Pat. No. 3,820,386. This application Apr. 18, 1974, Ser. No. 461,993
Int. Cl. G01m *15/00*
U.S. Cl. 73—119 R 26 Claims



1. A method for determining the top dead center position of a selected piston in an internal combustion engine having at least three cylinders based on the position of one other piston other than said selected piston, said method including positioning said other selected piston at the uppermost point in its stroke, measuring the distance from the top of said other piston's respective cylinder bore to the head of said one other piston, positioning said one other piston at the lowermost position in its stroke, again measuring the distance from the top of said cylinder bore to the head of said one other piston, determining from said measurements the stroke of said one other piston, and thereby determining the throw of the crankshaft of said internal combustion engine, determining from the type of internal combustion engine being operated upon, the angle which the journal corresponding to said one other piston must be set at, measured from the center line plane of the engine's cylinder bore, such that the selected piston will be at its top dead center position, determining from said angle, said crankshaft throw, and the length of said connecting rod corresponding to said one other piston, the distance measured from the top of the cylinder bore of said one other cylinder which said one other piston must be placed at to insure said selected piston is at its top dead center position, placing the head of said one other piston at said distance measured from the top of the cylinder bore, and marking the position of said selected piston as being in the position of top dead center.

3,889,529

RECTANGULAR HYDRAULIC LOAD CELL

Chester D. Bradley, Darien, Conn., assignor to The A. H. Emery Company, New Canaan, Conn.

Filed Apr. 17, 1974, Ser. No. 461,587
Int. Cl. G01l *1/02*; G01g *5/04*
U.S. Cl. 73—141 R 6 Claims

1. A hydraulic load cell comprising, in combination:

A. a base member

1. having means forming a rectangular fluid reservoir therein,

2. and having outlet means connectable to a pressure transducer;

B. a thin flexible diaphragm overlaying said fluid reservoir means;

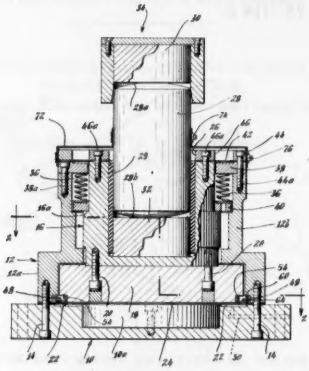
C. means for securing said diaphragm to said base to contain fluid under pressure;

D. a column positioned over said diaphragm,

1. said column having a lower portion adjacent said diaphragm of rectangular configuration and generally conforming to the shape of said fluid reservoir means,

2. said lower column portion having means forming an extending portion to form shoulders around the periphery of said lower portion, said shoulders having a substantially vertical and a substantially horizontal surface;

E. a casing surrounding said lower column portion,



1. said casing being of a rectangular configuration,

2. and having shoulders around its lower end in substantially horizontal alignment with said column shoulders, said shoulders having substantially vertical and substantially horizontal surfaces;

F. four elongated bridging members positioned around said column between the shoulders of said column and the shoulders of said casing ring,

1. said bridging members each having 45° angles at their ends to provide essentially continuous bridging in a rectangular configuration between said casing and said column; and

G. low friction pivot means between said horizontal surfaces of said column shoulders and said bridging members and between said horizontal surfaces of said casing shoulders and said bridging members.

3,889,530

FLUID PRESSURE TESTING APPARATUS

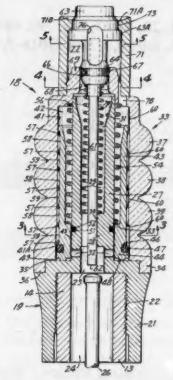
Gary R. Bluem, 7980 Wynnwood Rd., Minneapolis, Minn. 55427

Continuation-in-part of Ser. No. 366,682, June 4, 1973, Pat. No. 3,866,563. This application June 10, 1974, Ser. No. 477,699

Int. Cl. B60c *23/02*

U.S. Cl. 73—146.8 **49 Claims**

1. A fluid pressure testing apparatus for indicating the pressure of a fluid in a container having a normally closed valve connected to the container comprising: body means having a passage in communication with the valve, housing means mounted on the body means, said housing means having a viewing section, said body means and housing means defining a chamber, piston means located in said chamber, first information means on one portion of the piston means and second information means on another portion of the piston means, biasing means yieldably holding the piston means in a first position wherein said first information means is visually observable through the viewing section, plunger means extended through said passage of the body means, said plunger means having a portion located outside of the housing means that is manually engaged to move the plunger means from a first



position to a second position to open the valve whereby fluid under pressure from the container exerts a force on the piston means, when said force on the piston means is greater than the force of the biasing means that piston means moves to a second position wherein said second information means is visually observable through the viewing section.

3,889,531

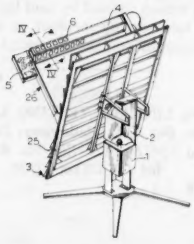
WEATHERING TEST APPARATUS

Nagaichi Suga, No. 2, Toyamacho, Shinjuku-ku, Tokyo, Japan

Filed Apr. 5, 1974, Ser. No. 458,451

Int. Cl. G01n *17/00;* **G02b** *27/32*

U.S. Cl. 73—150 R **4 Claims**



1. An improved weather test apparatus including a reflecting mirror support frame, reflecting mirrors mounted thereon for condensing sunlight toward a test piece, and a support member for positioning the test piece for receiving the condensed sunlight thereupon, wherein the improvement comprises:

a rotary test piece support member comprised of a pair of multisided end plates, a plurality of transverse members, each connecting a respective corner of said end plates for rigid separation thereof, a plurality of test piece adaptor plates connected between said end plates at locations corresponding to each of the sides of said end plates and having test pieces supported thereon, said test piece adaptor plates defining air flow passages between adjacent adaptor plates, a plurality of air flow adjusting plates, at least one mounted on each of said transverse members for slidable movement laterally of said transverse member, a first shaft fixedly coupled to one of said end plates,

said first shaft adapted for rotating said test piece support member, a second shaft, one end thereof being slidably coupled to and extending through the other of said end plates into the interior of the said rotary test piece support member and the other end being rigidly mounted to said support member, said second shaft being hollow and said one end being open within the interior of said test piece support member, and an arcuate wind direction plate positioned over said second shaft and downwardly extending thereabout;

means for rotating said first shaft, operatively coupled thereto and to said support member, and

air blowing means coupled to said second shaft.

3,889,532

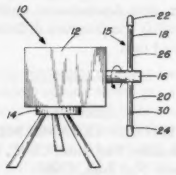
FOG WATER COLLECTOR

Roland J. Pilie, Williamsville, and Eugene J. Mack, Alden, both of N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 28, 1974, Ser. No. 501,306

Int. Cl.[2] G01W *1/00*

U.S. Cl. 73—170 R **6 Claims**



1. A fog water collector comprising:

at least one hollow elongated tube having a slotted opening formed along a substantial portion of the length of said tube;

means for rotating said tube in a direction such that said fog water passes through said slotted opening and impacts on the back wall of said tube; and

removable container means for each said tube, said container means receiving the fog water impacted on said tube as it moves to the ends of said tube under the influence of the centrifugal rotational force.

3,889,533

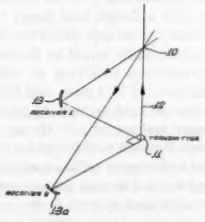
ACOUSTIC WIND SENSOR

Martin Balser, Covina, Calif., assignor to Xonics, Inc., Van Nuys, Calif.

Filed July 19, 1973, Ser. No. 380,897

Int. Cl. G01w *1/06;* **G01s** *9/66*

U.S. Cl. 73—189 **14 Claims**



1. In a system for measuring the wind velocity at a specific location, the combination of:

an acoustic echo system transmitter for directing a beam of acoustic energy toward a zone spaced from said transmitter;

a plurality of receivers for said transmitter and spaced from each other and from said transmitter, with each receiver directed toward said zone for receiving acoustic energy of said transmitter scattered by wind in said zone and providing a receiver output signal having a doppler frequency component; and

signal processor means having the receiver output signals as inputs for generating a processor output signal varying as a function of the vector velocity of the wind in said zone.

3,889,534

FLOWMETERS

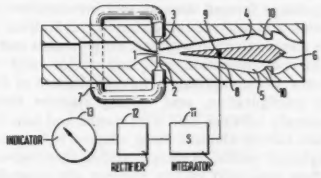
John Grant, Warrington, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Mar. 14, 1973, Ser. No. 341,080

Claims priority, application United Kingdom, Mar. 24, 1972, 14130/72

Int. Cl. G01f *5/00*

U.S. Cl. 73—194 B **4 Claims**



1. A method of measuring mass fluid flow, the method comprising the steps of passing the fluid flow through a fluidic oscillator of the wall attachment type whereby pressure changes caused by the flow are substantially proportional to the square of the fluid velocity, sensing pressure changes in the fluid flow through the oscillator, converting the sensed pressure changes to a signal representative of the amplitude and frequency of the pressure change, integrating the signal and determining the value of the integrated signal.

3,889,535

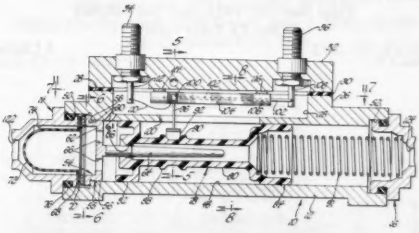
FLOW SENSOR AND SYSTEM

David W. Bull, and Gerald K. Miller, both of Hersey, Mich., assignors to Nartron Corporation, Reed City, Mich.

Filed Jan. 30, 1974, Ser. No. 437,925

Int. Cl. G01f *1/00*

U.S. Cl. 73—208 **9 Claims**



1. A fluid flow sensor, comprising housing means, movable wall means resiliently urged by resilient means in a first direction, variable orifice means, inlet means effective for communicating with said variable orifice means, outlet means effective for communicating with said variable orifice means, said movable wall means being effective when acted upon by a fluid admitted through said inlet means to move in a second direction opposite to said first direction and in so doing to vary the effective flow area of said variable orifice means, addi-

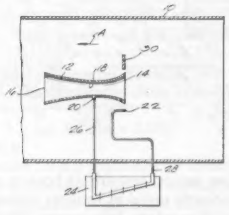
tional means operatively connected to said movable wall means effective for producing an output signal indicative of the distance traveled by said movable wall means in said second direction, a cylindrical passage formed in said housing means, said movable wall means comprising a piston closely received and axially movable in said cylindrical passage, said piston comprising first and second axially spaced piston-like cylindrical portions respectively defining first and second axially spaced outer cylindrical land surfaces slidably engageable with said cylindrical passage, said first and second axially spaced piston-like cylindrical portions and said first and second axially spaced cylindrical land surfaces being respectively spaced from each other by and integrally formed with an intermediate necked-down portion as to thereby define a generally annular space as between said cylindrical passage and said intermediate necked-down portion, a first wall portion integrally formed with and carried by said first piston-like cylindrical portion as to extend generally transversely to the axis of said first cylindrical land surface as to prevent flow therethrough, said variable orifice means comprising an orifice of fixed dimension formed through said first wall portion, a second passage formed through said intermediate necked-down portion and said second piston-like cylindrical portion as to be in communication with said outlet means and at least at times in communication with said orifice, said variable orifice means also comprising a valving element of fixed but contoured configuration, said valving element being supported generally between said inlet means and said first wall portion, said valving element being adapted to be received in and through said orifice to thereby define therebetween said effective flow area, said valving element also extending into said second passage as to be effective to vary said effective flow area as said piston and said first wall portion are axially moved toward and away from said inlet means by the action of said fluid against said first wall portion, said additional means comprising variable electrical resistance means, said resistance means comprising a generally elongated resistance element carried by said housing means, said elongated resistance element being situated as to have its longitudinal axis generally parallel to but spaced from the axis of said cylindrical passage as to result in said elongated resistance element being situated without said cylindrical passage, and electrical contact means carried by said intermediate necked-down portion and operatively slidingly engaging said elongated resistance element to complete an electrical circuit therethrough.

3,889,536

FLOW MEASURING AND MONITORING APPARATUS

Gordon C. Sylvester, Verona, Wis., assignor to Wehr Corporation, Milwaukee, Wis.

Filed Mar. 29, 1973, Ser. No. 345,864
Int. Cl. G01f 1/00
U.S. Cl. 73—212 **4 Claims**



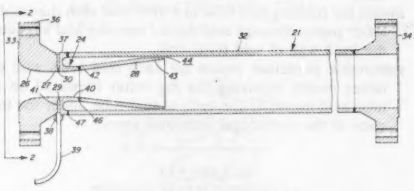
1. In combination
means defining a main flow passage,
walls defining a restricted passage in said main flow passage having a longitudinal axis extending generally parallel to the direction of flow through said passage, the outer surfaces of said walls being exposed directly to the interior of said main flow passage and said restricted passage characterized by upstream and downstream ends exposed directly to the interior of said main flow passage, a reduced diameter throat area spaced inwardly from said downstream end, and said walls flaring outwardly from said throat area to said downstream end,
means defining a first pressure sensing tap in said restricted passage at said throat area so that the pressure sensed by said first tap corresponds to the pressure condition at said throat area,
means defining a second pressure sensing tap in said main flow passage spaced from said restricted passage so that the pressure sensed by said second tap corresponds to the total pressure condition in said flow passage,
output means operable in response to pressure differential, conduits connecting said first and second taps to said output means so that said output means operates in response to the pressure differential sensed by said first and second taps as a medium flows through said passage,
and an annular flange attached to said walls defining said restricted passage and projecting laterally therefrom, said annular flange being located, with reference to flow through said main flow passage, adjacent at least one of said upstream and downstream ends of said restricted passage to amplify the pressure differential sensed by said first and second taps.

3,889,537

VENTURI ARRANGEMENT

Kamel Ahmad Khuzaie, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Oct. 11, 1973, Ser. No. 405,266
Int. Cl. G01f 1/00
U.S. Cl. 73—213 **6 Claims**



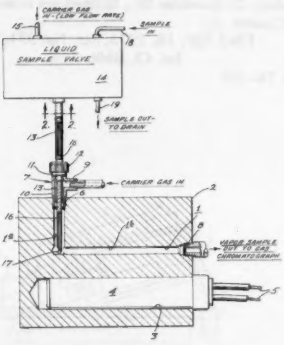
1. For use in a pipe line for conducting a flow of fluid, a flanged section of pipe for removable connection in said pipe line and a venturi formed in said section of pipe comprising: a convergent inlet section and a throat section of said venturi formed integrally with a flange, said flange having an outside diameter greater than the outside diameter of said pipe and an inside diameter substantially equal to the inside diameter of said pipe, said throat section having an inside diameter less than the inside diameter of said pipe, said flange being welded to an upstream end of said section of pipe; a pressure tap formed in the inner surface of said throat section and connected by a passage through said flange to an exterior surface of said flange; and a divergent diffuser section having a small-diameter inlet end welded to said throat section and having a larger diameter outlet end spaced from an inner surface of said pipe at a given ambient temperature, said diffuser section being formed of a metal having a higher thermal coefficient of expansion than the metal of which said pipe is formed whereby at an operating temperature greater than said ambient temperature said outlet end of said diffuser section contacts said inner surface of said pipe.

3,889,538

SAMPLE VAPORIZER FOR GAS CHROMATOGRAPHY

Alfred A. Fingerle, Newtown Square, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed June 5, 1974, Ser. No. 476,626
Int. Cl. G01n *1/00*
U.S. Cl. 73—422 GC 10 Claims



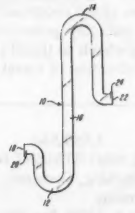
1. An apparatus for introducing a small sample of a volatile liquid into a chromatographic carrier gas stream which comprises: a block of heat-conducting metal, said block having a continuous carrier-gas transmitting conduit extending through the interior thereof with an inlet end and an outlet end both opening into the outer surface of the block; heater means for heating said block to an elevated temperature with respect to the ambient, a sample-liquid transmitting conduit of oleophobic material extending through said conduit inlet end into communication with said continuous conduit at a point in the interior of said block, and means providing for connection of said conduit outlet end to a chromatographic column.

3,889,539

DIP TYPE MEASURING DISPENSER

Owen A. Miller, 4732 E. National Rd., Springfield, Ohio 45505

Filed Mar. 29, 1973, Ser. No. 346,105
Int. Cl. G01n *1/12*
U.S. Cl. 73—425.4 R 10 Claims



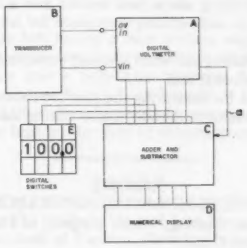
1. A dip type measuring dispenser consisting of a tubular structure, said structure including an intermediate straight segment of tubing having extensions to either end the remote end portion of each of which is formed into a hook shaped configuration to provide a chamber to either end thereof an opening to which is formed at the adjacent projected end of said tubular structure, said chambers thereby providing a measuring segment of said tubular structure to either end thereof, each said chamber being composed of two branches connected by a base portion the contents of which will have a prescribed volume and an opening to which chamber is provided by the open end of the hook shaped end portion to provide thereby that the introduction of a hook shaped end portion of said structure into a body of fluid will inherently introduce therein a prescribed volume of said fluid.

3,889,540

APPARATUS FOR CONTROLLING THE FEELER DISPLACEMENT OF AN ELECTRONIC DIMENSIONAL

Werner Widmer, Chatelaine-Geneva, Switzerland, assignor to Societe Genevoise d'Instruments de Physique, Geneva, Switzerland

Filed Mar. 5, 1973, Ser. No. 337,908
Claims priority, application Switzerland, Apr. 6, 1972, 5081/72
Int. Cl.[2] G01B *3/00*
U.S. Cl. 73—432 A 2 Claims



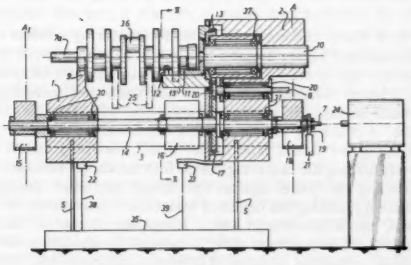
1. In an electronic dimensional sensor having a displaceable feeler that bears against a surface to measure a dimension corresponding to the position of said surface, and a micro-indicator display of feeler displacement; the improvement comprising means for adding to or subtracting from the displayed displacement a value equal to the value of feeler displacement corresponding to a predetermined force between said feeler and said surface, and means to detect the sign of the measurement and to effect said addition or subtraction according to said sign, said adding or subtracting means comprising, connected to the output of a digital voltmeter, an adder and subtracter controlled both by the sign of the measurement and by control switches, said adder and subtracter feeding a numerical display means.

3,889,541

BALANCE APPARATUS

Christian Langlois, Billancourt, France, assignor to Regie Nationale des Usines Renault, Billancourt, France

Filed May 18, 1973, Ser. No. 361,438
Claims priority, application France, June 1, 1972, 72.19778
Int. Cl. G01m *1/20, 1/16*
U.S. Cl. 73—460 9 Claims



1. An apparatus for comparing the dynamic want of balance of a workpiece having an axis of rotation about which it can

rotate to a dynamic reference want of balance and for dynamically balancing rotating workpieces of which it is desired to preserve a given residual want of balance comprising,

a fixed base;

at least two vertical flexible elements extending from said base;

a frame supported by said flexible elements;

means on said frame defining a first reference axis having a shaft rotatably mounted on said frame;

a pair of want-of-balance inertia weights spaced from each other on said shaft to create a moment equal to the desired residual want-of-balance and graduations on said shaft to accurately position said weights;

workpiece holding means on said frame defining a second axis of rotation parallel to said shaft capable of rotating a rotary workpiece with its axis of rotation coincident with said second axis of rotation;

a member rotating about said second axis and capable of fastening to said rotating workpiece for rotation of said workpiece;

means for rotating said shaft and said workpiece at the same angular velocity; and

sensor means for measuring the characteristics of the horizontal movement of said frame during said workpiece rotation.

3,889,542

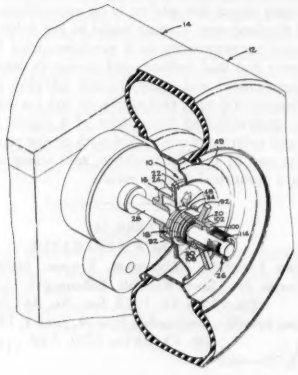
WHEEL MOUNTING APPARATUS

Tracy Carrigan, Lansing, Mich., assignor to FMC Corporation, San Jose, Calif.

Filed Nov. 9, 1973, Ser. No. 414,474

Int. Cl. G01m *1/02*

U.S. Cl. 73—460 **20 Claims**



1. A wheel mounting apparatus for centering a wheel and tire assembly having a center hole relative to the axis of a shaft and for rigidly clamping the assembly to the shaft including, an adapter slidably received on the shaft and including a tubular portion and a flange disposed normal to the axis of the tube, a centering device slidably received on the tube for engaging the center hole in the wheel, clamping means for firmly forcing the centering device into the center hole and for clamping the wheel against the flange, and shaft engaging means for locking the centered wheel and tire assembly on the shaft; the improvement which comprises means defining a plurality of steps on the outer surface of the centering device having cylindrical surfaces of different diameters, and means defining a plurality of axially elongated evenly spaced resilient fingers on said centering device separated by tube engaging segments, said resilient fingers being bent outwardly relative to the outer surfaces of said segments for engaging and being compressed by the inner surface of the center hole when in wheel centering position.

3,889,543

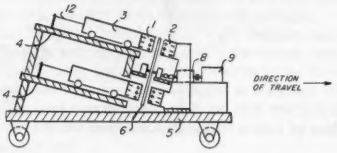
PROPULSION SYSTEM

Oscar Mast, 24 Sunshine Dr., Dollard des ormeaux 980, Quebec, Canada

Filed Apr. 16, 1973, Ser. No. 351,329

Int. Cl. B60k *9/00*

U.S. Cl. 74—88 **4 Claims**



1. A vehicle propulsion system comprising:

a substantially horizontal base member,

a plurality of wheels supporting said base member above the ground,

an inclined surface mounted on said base member,

said inclined surface having a negative slope in the direction of travel of the propulsion system,

a stationary permanent magnet mounted on the horizontal base member,

a reciprocating assembly operatively mounted on the inclined surface

said reciprocating assembly containing at least one permanent magnet facing said stationary magnet,

means for alternately establishing and cancelling the magnetic field between the two magnets, whereby the establishment of the magnetic field causes the reciprocating assembly to move up the inclined surface and, upon cancellation of the field, to return to its original position under the influence of gravity to thereby impart a continuous reciprocation of the reciprocating assembly,

said reciprocating assembly generating forces which are transmitted to the wheels to thereby propel the system in a predetermined direction of travel.

3,889,544

LEAD-SCREW-FINE ADJUSTMENT DRIVE FOR A SLIDE

Winfried Suss, Unterhaching, Germany, assignor to Karl Suss KG, Garching, Germany

Filed May 8, 1974, Ser. No. 467,920

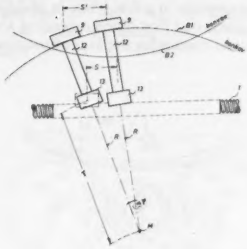
Claims priority, application Germany, May 19, 1973, 2325612

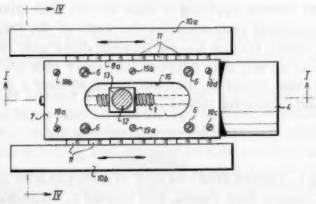
Int. Cl. F16h *27/02*

U.S. Cl. 74—89.15 **10 Claims**

1. In a lead screw-fine adjustment drive for a slide reciprocably movable in essentially a straight line manner within an associated guideway, the slide being movable along a plane parallel to a lead screw by means of a nut engaging into the threads of the lead screw, with the plane of the nut running essentially perpendicular to the lead screw axis, and being slightly tiltable, and with an entrainment member rigidly joining the nut with the slide, said drive being characterized in that

means are provided for bowing the guideway convexly toward or concavely away from the lead screw as a function of effec-





tively slightly lengthening or shortening of the lead screw by means of transversely disposed adjustment members.

3,889,545

TRANSMISSION BELT

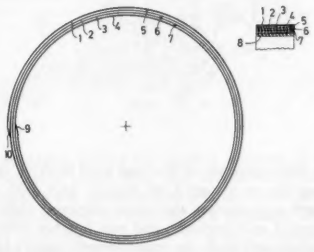
Mikas Baublys, and Eugen Siegloch, both of Freiligrathstr. 23 7000-50, Stuttgart, Germany

Filed Jan. 17, 1973, Ser. No. 324,086

Claims priority, application Germany, Jan. 17, 1972, 2202041

Int. Cl. F16g *1/20*

U.S. Cl. 74—231 M **7 Claims**



1. A transmission belt comprising an endless band arranged for driving engagement over a pair of pulleys, said band consisting of a single length of a thin flexible metal strip disposed in a helically wound structure formed of a plurality of superimposed layers, and elastic connection means intermediate said layers elastically connecting said layers together for integrated assembly but allowing a desired longitudinally movability therebetween to provide for the necessary bending stresses as the belt moves around a pulley.

3,889,546

PRODUCTION OF V-TYPE TRANSMISSION BELTS

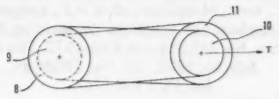
Charles Houdret, and Jacques Marchand, both of Saint-Leger-des-Vignes, France, assignors to Pneumatiques, Caoutchouc Manufacture and Plastiques Kleber-Colombes, France

Filed July 30, 1973, Ser. No. 383,467

Claims priority, application France, July 28, 1972, 72.27212

Int. Cl. F16g *5/00;* **B29h** *7/22*

U.S. Cl. 74—234 **18 Claims**



1. A V-type belt having a base portion, said base portion comprising a vulcanized rubbery mixture containing at least one elastomer and a polyolefin having a high molecular weight, said mixture having been brought at least once to a temperature higher than the melting temperature of the polyolefin, and at least by the time of vulcanization.

3,889,547

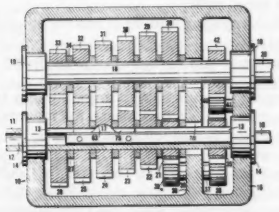
HYDRAULICALLY SELECTABLE GEAR TRANSMISSION

Jun-Kai Sun, 516 Dufferin St., and Lian-Sheng Lo, 182 Ossington Ave., both of Toronto, Ontario, Canada

Filed Sept. 13, 1973, Ser. No. 397,134

Int. Cl. F16h *5/60, 3/08*

U.S. Cl. 74—336 **8 Claims**



1. In a gear transmission having drive and driven shafts in parallel spaced apart relationship in a housing and gear pairs of different drive ratios for transmitting drive from said drive shaft through a selected pair of gears to said driven shaft, the combination for hydraulically selecting a gear pair ratio comprising: means on said drive and driven shafts rotatably mounting the gears thereof in predetermined non-shiftable spaced apart positions thereon in meshing relationship of each gear pair, the gears on said drive shaft at least being freely rotatable thereon; a selector movable longitudinally of said drive shaft and having an actuator rod coaxially connected thereto said selector when positioned at a drive gear being adapted to establish a mechanical drive relationship between the drive shaft and said drive gear; an hydraulic cylinder having an inlet chamber and an outlet chamber separated by a piston and a piston rod extending therefrom to position said actuator rod and the selector of said transmission drive shaft; a compressible gas containing accumulator for said outlet chamber; a fluid pump and means for driving same responsive to the speed of said drive shaft; an hydraulic fluid sump connected to said pump; an outlet line for said pump delivering pumped fluid to the inlet chamber of said cylinder; means returning fluid from said outlet line to said sump and limiting the pressure in said outlet line and said inlet chamber to a predetermined maximum equal to the pressure in said accumulator thereby to define a thus selected position of said

piston together with said selector; means for returning fluid from said outlet line to said sump, each of said means limiting the pressure in said outlet line to different predetermined value; and a manually operable selector valve selectively connecting any one of said fluid returning means to said sump thereby defining the drive ratio of said transmission by the gear pair position of said selector.

3,889,548

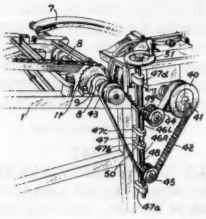
CHANNELING CONVEYOR

Hubert E. Tobey, Milltown; John W. Hood, East Brunswick, and Dee L. Irvin, Moonachie, all of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Division of Ser. No. 248,570, April 28, 1972. This application July 16, 1973, Ser. No. 379,868

Int. Cl. F16h *35/06*

U.S. Cl. 74—395 **3 Claims**



1. Speed control means comprising in combination:
an input speed pulley;
an output speed pulley;
a timing belt engaging said input and output pulleys within a closed loop;
a shaft having a right hand thread portion and a left hand thread portion;
first means for mounting a first tension pulley on said right hand portion and second means for mounting a second tension pulley to said left hand portions;
means mounting said shaft and detachably coupling said right and left portions, so that said first pulley engages said timing belt within said closed loop, and said second tension pulley engages said timing belt outside said closed loop; and
means for selectively turning said shaft to cause said first and second means to move axially toward each other and said output speed pulley to move faster than said input speed pulley when said shaft is moved in a first direction, and slower when said shaft is moved in a second direction and said first and second means to move axially away from each other.

3,889,549

REVERSIBLE-OUTPUT ROTARY GEAR DEVICE

Jean Henri Fieuzal, Rueil Malmaison; Louis Bourgine, Chambourcy, and Rene Pierre Benzoni, Ornesson, all of France, assignors to Etat Francais, France

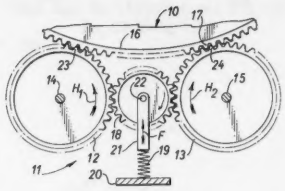
Filed Feb. 22, 1974, Ser. No. 445,291

Claims priority, application France, Mar. 14, 1973, 73.09022

Int. Cl. F16h *55/18*

U.S. Cl. 74—409 **9 Claims**

1. A reversible-output rotary gear device for applying rotation in either direction to a rotatable member and comprising:
a gear, means to mount the same member;
first and second drive gears, means to mount the same with a space therebetween and each coupled with the first driven gear for relative rotation therebetween, means to drive one drive gear in one direction to cause rotation of the first gear in one direction with the other drive gear idle, and means to drive said other drive gear in an opposite direction to cause rotation of the first gear in the opposite direction with said one drive gear idle;
an intermediate gear coupled with the first and second drive gears and moveable in a first plane in said space between the drive gears, said first plane extending transversely of a second plane containing the axes of rotation of the drive gears;



resilient means applying a bias in said first plane to the intermediate gear whereby the teeth of the intermediate gear apply biasing torque to each drive gear, when idle, to take up any play between said drive gear and said first gear, said rotatable member being at least a part of one of said mounting means.

3,889,550

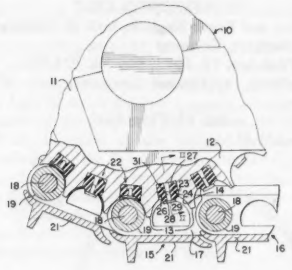
IMPACT ABSORBING NOISE SUPPRESSION DEVICE

Roger L. Boggs, East Peoria, and Harold L. Reinsma, Dunlap, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 19, 1973, Ser. No. 416,828

Int. Cl. F16h *55/14*, *55/30*

U.S. Cl. 74—443 **6 Claims**

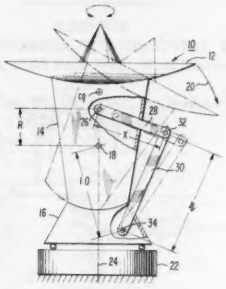


1. In a drive sprocket of the type used to drive an endless track assembly on a track-type vehicle, said drive sprocket having teeth and notches alternately disposed about the circumference of said sprocket, and said notches defining root areas between said teeth, the improvement comprising impact absorbing means for absorbing the impact energy of notch engaging assembly components as they engage the sprocket, said impact absorbing means including impact absorbing members comprising elastomeric plugs disposed within cavities formed in said root areas and extending outwardly into said notches sufficiently to contact said notch engaging components prior to contact between said components and said root areas, said plugs being reinforced by wear plates secured to the outer ends thereof, and wherein said wear plates are secured to said plugs by coaction of a rod secured to each of said wear plates and a bore within each of said plugs.

3,889,551
EQUIPOISE MECHANISM

Wayne Arthur Harmening, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 27, 1973, Ser. No. 428,796
Int. Cl. G05g 1/00
U.S. Cl. 74—469 10 Claims



1. An apparatus for balancing a non-linear torque produced by an offset mass rotating with respect to a support, comprising:

a four bar linkage wherein each bar is pivotally connected to two other bars of the linkage to form a quadrangle,

means for securing a first bar to said rotating mass,

means for securing said support to a second bar, and

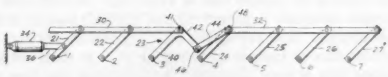
resilient means coupled to said second bar, and a third bar for producing a linear torque on the third bar as that third bar rotates,

said bars each having a predetermined length, the length of each bar being a function of the angular displacement of the third bar with respect to the angular displacement of the rotating mass, the length of the bars being such that the linear torque at the third bar balances said non-linear torque.

3,889,552
ACTUATING DEVICE FOR MULTIPLE DAMPERS

Thomas Clifton McGough, Jr., Longmeadow, Mass., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 3, 1973, Ser. No. 421,386
Int. Cl. G05g 1/04
U.S. Cl. 74—519 3 Claims

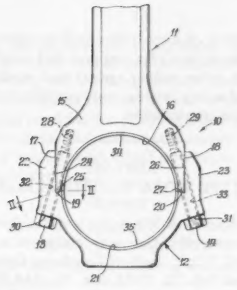


1. An actuating device for causing rotation of first and second members about first and second stationary pivot points, respectively, between first and second positions, the second positions being 90° from the first positions, said actuating device including a first link of dogleg configuration, a second link, a third link, a first leg of the first link being integral with the first member, and being rotatable about the first stationary pivot point at its outer end, the second leg of the dogleg being connected to one end of the second link by means of a first movable pivot point, the other end of the second link being connected to one end of the third link by means of a second movable pivot point, the other end of the third link being integral with the second member, and being rotatable about the second stationary pivot point, the first leg of the dogleg being parallel with the third link when the first and second members are in their first positions, means for causing 90° rotation of the first member, the length of the second leg of the dogleg, the length of the second link, and the angle included between the first and second legs of the dogleg, being so proportioned that the first leg of the dogleg and the third link will be parallel after 90° rotation of the first member, whereby during initial rotation of the first member no rotation of the second member occurs, but after 90° of rotation of the first member, the second member will also have rotated 90°.

3,889,553
CONNECTING ROD ASSEMBLY

Benny Ballheimer, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 21, 1974, Ser. No. 444,523
Int. Cl. F16c 7/02
U.S. Cl. 74—579 R 6 Claims



1. A connecting rod assembly, comprising

a connecting rod;

a saddle formed at the end of said connecting rod having an inner cylindric surface, a pair of outer surfaces, and a pair of end surfaces with each of said end surfaces extending between said cylindric surface and one of said outer surfaces;

a cap having an inner cylindric surface sized to match the cylindric surface in said saddle;

said cap also being formed with legs having inner surfaces adapted to provide a matching configuration with the said outer surfaces and said end surfaces of the saddle; and

a pair of connecting bolts disposed on opposite sides of said cylindric surfaces for securing the cap to the saddle;

said saddle being formed with a width slightly exceeding the diameter of said cylindric surface, whereby the saddle is small enough to allow the connecting rod to be removed through its associated cylinder, and said cap being formed with legs thicker than the width of each end surface of the saddle, whereby the saddle is strengthened at the sides adjacent the ends thereof.

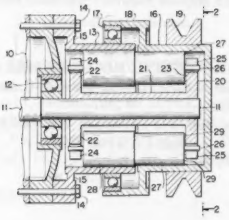
3,889,554
ROLLER TRANSMISSION

Brett Jason Sinclair, 150-11 72nd Rd., Flushing, N.Y. 11367, and Harold Youngelson, 647 Academy St., New York, N.Y. 10034

Filed Jan. 9, 1974, Ser. No. 431,922
Int. Cl. F16h 13/06, 13/10
U.S. Cl. 74—798 1 Claim

1. A roller transmission comprising, in combination, an input shaft, a fixed ring disposed about said shaft, a rotatably mounted ring disposed about said shaft, said rings having larger and smaller cylindrical inner surfaces, rollers each having larger and smaller cylindrical portions, said larger and smaller cylindrical portions of said rollers differing in diameter the same amount as the larger and smaller cylindrical inner surfaces of said rings, and a spider mounted on said shaft, said spider having pairs of arms containing radial slots receiving

said axles, each pair of said arms mounting one of said rollers therebetween, said spider revolving said rollers with said shaft so that on rotation of said shaft centrifugal force urges said rollers outward moving said axles in said slots, said larger



cylindrical portion of each roller rolling against said larger cylindrical inner surface of a ring and said smaller cylindrical portion of each roller rolling against said smaller cylindrical inner surface of a ring driving said rotatably mounted ring as an output of said transmission.

3,889,555

INDEXING-TYPE WORK PLATFORM FOR MACHINE TOOLS

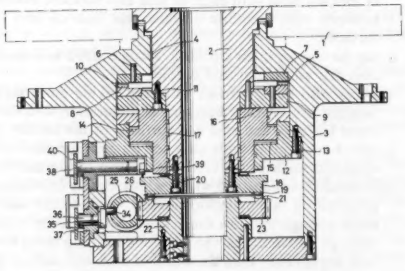
Rudolf Frank; Karl Emil Witzig, both of Leonberg, and Armin Witzig, Hofingen, all of Germany, assignors to Rudolf Frank and Karl Emil Witzig, both of Leonberg, Germany

Filed Feb. 22, 1974, Ser. No. 444,946

Claims priority, application Germany, Feb. 23, 1973, 2308984

Int. Cl. B23b *29/32*

U.S. Cl. 74—826 **14 Claims**



1. Indexing-type work table or platform (**1**) adapted to have work pieces secured to an upper circumference thereof comprising

a base (**3**);

a central column or post (**2**) centrally supporting the table and journalled in the base (**3**) to rotate about the vertical axis when the table is being indexed;

drive means (**23**) operatively connected to the table to rotate the table for indexing motion thereof;

and means (**5**) locking and angularly aligning the table with respect to the base in predetermined angular positions, characterized by

vertical operating means acting on the table to drop the table (**1**) with respect to the locking means (**5**) to disengage the locking means and release the table from locked engagement, in angular position, for indexing movement, and to raise the table, after indexing movement, and engage the locking and alignment means when the work pieces are to be engaged by machine tools.

3,889,556

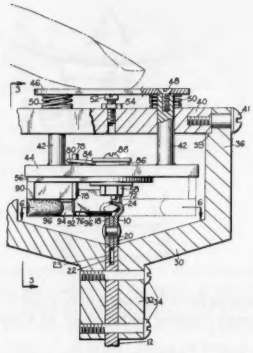
SAW BAR MOUNTED SHARPENER FOR CHAIN SAWS

Howard C. Bair, and Richard C. Larsen, both of 2171 S.E. 130th Ave., Portland, Oreg. 97233

Continuation-in-part of Ser. No. 323,958, Jan. 15, 1973, abandoned. This application Apr. 1, 1974, Ser. No. 456,739

Int. Cl. B23d *63/00*

U.S. Cl. 76—25 A **12 Claims**



1. A saw chain sharpener for a chain saw of the type having a saw bar and a saw chain driven around the bar and having oppositely facing cutter elements, said sharpener comprising,

a. a holder having a chain pass area therein,

b. a pair of saw sharpening elements on said holder disposed in said chain pass area,

c. and means arranged to mount said holder on the saw in a position such that the chain on the bar when operating around the bar moves through said chain pass area,

d. said pair of saw sharpening elements being arranged to have alternate engagement with oppositely facing cutter elements on the saw chain as the latter moves around the bar.

3,889,557

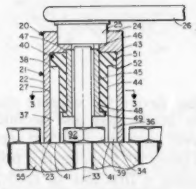
STUD REMOVING TOOL

Richard H. Young, 212 Andover Rd., Billerica, Mass. 01821

Filed Aug. 14, 1974, Ser. No. 497,226

Int. Cl. B25b *13/50*

U.S. Cl. 81—53.2 **17 Claims**



1. In a stud, or nut, gripper tool of the type having at least one roller, or pin, co-acting with a lobular cam face to move radially for gripping a stud or nut, the combination comprising:

an elongated, hollow tubular casing having an inner end and an outer end and having an inside elongated face with at least one axially extending lobe formed therein;

at least one elongated, axially-extending, generally cylindrical roller, having an inner end and an outer end, in rolling contact with one of said lobes to move radially while moving circumferentially relative thereto;

retaining means mouted within said casing in engagement with the inner ends of said rollers for maintaining said rollers in rolling contact with said lobular inner face;

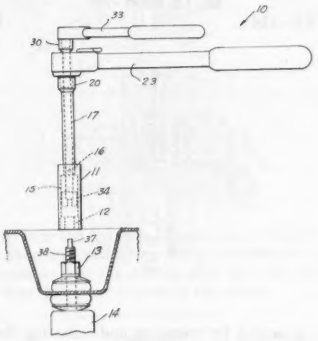
The outer ends of each said roller being free to roll and tilt, on the outer end of said lobular face, relative to the central longitudinal axis of said casing, when the outer ends of said rollers engage and tighten on a stud during turning of said casing on said axis.

3,889,558

SHOCK ABSORBER NUT REMOVING TOOL

Gorden E. Duncan, 1505 Park Blvd., West Sacramento, Calif. 95691

Filed Feb. 19, 1974, Ser. No. 443,617
Int. Cl. B25b
U.S. Cl. 81—55 **1 Claim**



1. A shock absorber nut removing tool comprising in combination an elongate nut engaging socket member having a bore extending substantially therethrough, a square socket communicating with said bore in the upper end of said socket member, an elongate hollow drive shaft having a square end portion adapted for seating in the square socket of said socket member, a ratchet handle detachably connected to the upper end of said hollow drive shaft and having a bore extending therethrough axially aligned with a bore in said hollow drive shaft, an elongate solid drive shaft extending through the bore in said ratchet handle and said hollow drive shaft, a ratchet handle detachably connected to the upper end of said solid drive shaft, a generally cylindrical coupler member detachably connected to the lower end of said solid drive shaft with said coupler member having a transverse slot extending across the lower face thereof, said bores in said hollow drive shaft and said first named ratchet handle having a diameter slightly larger than the diameter of said solid drive shaft to guide said solid drive shaft as it is rotated with respect to said ratchet handle and said hollow drive shaft, said bore in said socket member having a diameter slightly greater than the diameter of said cylindrical coupler to guide said cylindrical coupler as it is rotated in said socket member.

3,889,559

RETRACTABLE SCOOP FOR CATCHING MACHINED PARTS

Lorin H. Scholtes, 804 N. Riverview, Bellevue, Iowa 52031

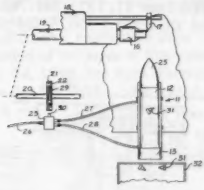
Filed June 10, 1974, Ser. No. 477,586
Int. Cl. B23b *13/00, 3/36*
U.S. Cl. 82—2.5 **5 Claims**

1. A machine attachment for catching parts comprising:

an extensible chute adapted to be attached to an automatic machine with a cutoff tool, one end of said chute being a catching portion with an open top for catching falling parts, said chute normally being retracted outside the path to be taken by falling parts and chips,

an extensible actuator connected between the opposite ends of said extensible chute,

control means connected to said actuator and adapted to be mounted on said automatic machine, a control operator adapted to be connected to said automatic machine to move in synchronism with the operation of said cutoff tool and to engage said control means, said control means



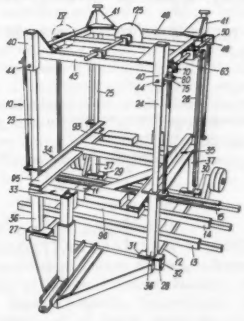
operating in response to engagement by said control operator to extend said extensible actuator and said chute for positioning said catching portion beneath said cutoff tool for an instant at the end of each of the cutoff operations of said machine for catching a part to be conveyed along said chute, and said control means reoperating at the end of each of said cutoff operations to retract said extensible chute.

3,889,560

SAWING APPARATUS

Duncan Gardner MacFadyen, Milton of Buchanan, Drymen by Glasgow, Scotland

Filed Feb. 26, 1974, Ser. No. 445,873
Claims priority, application United Kingdom, Mar. 6, 1973, 10920/73
Int. Cl. B27b *17/02, 15/02;* **B23d** *57/02*
U.S. Cl. 83—4 **10 Claims**

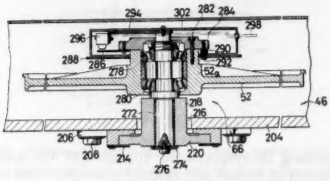


1. Sawing apparatus comprising a supporting base from which extend four uprights whose axes are at the vertices of a rectangle, a platform mounted for movement longitudinally of itself across said supporting base and between opposed pairs of said uprights, a cradle mounted for vertical sliding movement along said uprights and supporting in an underslung position a chain saw for sawing timber carried by said platform, and a head frame above said cradle and including tubular members dimensioned and positioned to fit slidably about said uprights, first locking means to lock said head frame relative to said uprights, said head frame mounting means for adjusting the level above said platform of said cradle and hence of said chain saw, and second locking means for locking said cradle at its adjusted level relative to said uprights.

3,889,561
HORIZONTAL BAND SAW MACHINE

Masao Sato, Sagamihara; Tsuneo Aizawa, Isehara; Kenji Ohnishi, Sagamihara; Shigeo Koizumi, Hatano; Akio Fukuda, Yokohama; Shinki Kikuchi, Sagamihara, and Shichiro Kusanagi, Isehara, all of Japan, assignors to Amada Company Limited, Isehara, Japan

Division of Ser. No. 159,625, July 6, 1971, Pat. No. 3,754,490.
This application June 11, 1973, Ser. No. 368,994
Int. Cl. B23d *53/00, 55/04*
U.S. Cl. 83—58 **1 Claim**

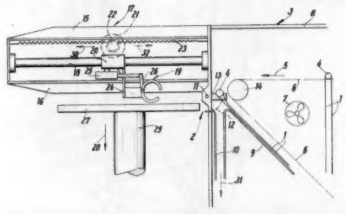


1. A horizontal band saw machine comprising at least one blade extending from one side of the outer surface of a cover mounted on a boss of a follower wheel which is rotatably mounted onto a shaft, an arm extending from one side of that portion of said shaft which extends upward through and out of said cover, a no-contact switch provided at said arm and spaced apart from said at least one blade, and a detector device connected to said switch.

3,889,562
INSTALLATION FOR PIECE-BY-PIECE THROUGHPUT OF ROLLED RUBBER SHEETS OUT OF A COOLING UNIT

Walter Hugo Schiesser, Zurich, Switzerland, assignor to Schiesser AG, Zurich, Switzerland

Filed May 18, 1973, Ser. No. 361,837
Claims priority, application Germany, June 13, 1972, 2228728
Int. Cl. B26d *7/02;* **B65h** *35/06*
U.S. Cl. 83—94 **16 Claims**



1. In apparatus for the removal of pressed rubber sheets from a sheet cooling installation and for ultimate delivery onto a receiving station, and wherein each pressed rubber sheet is passed through said sheet cooling installation while individually folded generally mid-way upon itself and deposited onto and retained on an associated hanger bar in hairpin fashion, with both end portions depending downwardly therefrom:

a. drive chain means forming a conveyor with said conveyor having an output end, elongated hanger bars coupled to said drive chain and extending generally parallelly to one another at spaced apart intervals to effect a feed motion generally perpendicular to the elongated axis of said hanger bars;

b. gripping means extending parallel to said hanger bars and being intermittently reciprocable adjacent the output end of said conveyor and arranged to grasp pressed rubber sheets from said hanger bars at a point adjacent said top fold, said gripping means including a pair of converging clamping members forming a jaw;

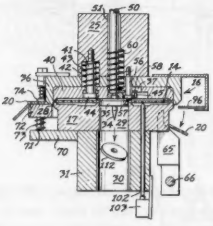
c. cutting means disposed generally within the confines of said jaw and arranged to sever said pressed rubber sheet along said fold area and within said jaw; and

d. means for intermittently reciprocably opening said gripping means to deposit said severed pressed rubber sheet onto said receiving station.

3,889,563
APPARATUS FOR TRIMMING AND REMOVING THE FLASHING FROM PHONOGRAPH RECORDS

William S. Westermann, 1400 Burton Valley Rd., Nashville, Tenn. 37215

Filed Dec. 26, 1973, Ser. No. 428,084
Int. Cl. B26d *7/06*
U.S. Cl. 83—124 **13 Claims**



1. An apparatus for trimming and removing the flashing from a pressed phonograph record, comprising:

a. a lower punch platen having a circular peripheral edge adapted to support centrally of said platen a pressed phonograph record having a flashing projecting radially beyond said peripheral edge,

b. an upper punch member having an annular rim die adapted to telescopingly receive said peripheral edge to sever the flashing from a pressed record centrally supported on said platen,

c. means for relatively moving said punch member toward and away from said punch platen,

d. hook means supported in an inoperative position within the perimeter of said peripheral edge, to permit the adjacent severed flashing portion to drop down over said hook means,

e. means for moving said hook means away from said platen so that said hook means engages the inner edge of said severed flashing to remove the flashing from said platen.

3,889,564
KNIFE EDGE ENDLESS LOOP BOOK CUTTER

Peter Aspinwall, Wheaton, Ill., and Richard H. Barbour, Jr., Milton, Mass., assignors to Comstock & Wescott, Inc., Cambridge, Mass.

Filed Jan. 23, 1974, Ser. No. 435,707
Int. Cl. B26d *1/46*
U.S. Cl. 83—174 **7 Claims**

1. Apparatus for cutting the sheets of a book comprising:

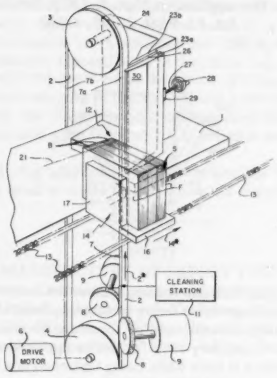
a travelling knife edge cutter including an endless loop carrying a cutting edge and means to guide the loop through a straight portion at a cutting station;

a book conveyor for moving a book through the cutting station, and

means on the conveyor for holding the book with the face of the book sheets facing substantially parallel to the cutting edge,

the cutting edge having a bevel angle and the loop guide means holding the cutting edge inclined to the face of the

sheets laterally of loop travel substantially at the bevel angle and with the bevel normal to the sheet face, and the book holding means and cutter loop guide means holding the sheet face at an angle to the straight portion



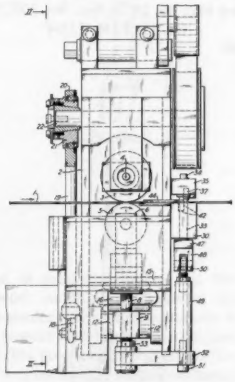
convergent in the direction of cutter travel with the plane of the sheet inclined forwardly in the direction of book movement so that the cutting edge pulls on the sheets away from the uncut portion of the sheets.

3,889,565

PUNCH PRESS SCRAP CUTTER

John C. Vecchi, Natrona Heights, Pa., assignor to Oberg Manufacturing Co., Inc., Freeport, Pa.

Filed Jan. 4, 1974, Ser. No. 430,778
Int. Cl. B26f *1/02;* **B26d** *5/26*
U.S. Cl. 83—255 **5 Claims**



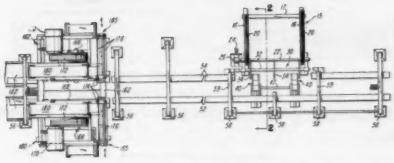
1. The combination with a punch press for metal strip having a driven outbound feed roll, a lower roll movable vertically toward and away from the upper roll, and means for reciprocating the lower roll vertically to periodically press strip against the upper roll; of a scrap cutter comprising a stationary lower shear blade at the exit side of said rolls in a position to engage the bottom of punched strip as it leaves the rolls, a cooperating movable upper shear blade spaced above the lower blade while said lower roll is in its upper position, and means operated by said roll-reciprocating means for moving the upper blade downwardly toward the lower blade for cutting strip between them every time the lower roll is lowered.

3,889,566

SAWMILL

George W. Hartzell, and Robert J. Gunnerman, both of Piqua, Ohio, assignors to Hartzell Industries, Inc., Piqua, Ohio

Continuation-in-part of Ser. No. 322,537, Jan. 10, 1973, which is a continuation-in-part of Ser. No. 152,751, June 14, 1971, Pat. No. 3,747,455. This application June 1, 1973, Ser. No. 365,859The portion of the term of this patent subsequent to July 24, 1990, has been disclaimed.
Int. Cl. B27b *7/04, 29/08*
U.S. Cl. 83—708 **9 Claims**



1. An improved sawmill adapted for efficiently cutting a successive supply of logs, comprising a set of elongated parallel spaced tracks, frame means supporting said tracks in horizontally spaced positions, a first carriage unit including a first set of wheels engaging said tracks in longitudinally spaced relation, said first set of wheels providing for independent longitudinal linear movement of said first carriage unit on said tracks, a second carriage unit including a second set of wheels also engaging said tracks in longitudinally spaced relation, said second set of wheels providing for longitudinal linear movement of said second carriage unit along said tracks independent of said first carriage unit, an elongated extensible actuator connecting said first and second carriage units and providing for changing the space between said carriage units within a predetermined range relative to said tracks, said carriage units including means supporting a set of horizontally disposed opposing dog members adapted to engage opposite ends of each log, means for adjustably connecting said actuator to one of said carriage units to provide for changing said predetermined range, drive means for moving said carriage units along said tracks as a combined unit, laterally adjustable cutter means positioned adjacent the path of said carriage units for cutting the log, and a motor on at least one of said carriage units and having a rotary shaft connected to rotate the corresponding said dog member for positioning the log at a selected cutting position.

3,889,567

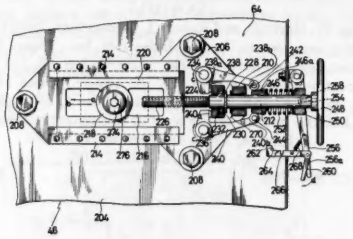
HORIZONTAL BAND SAW MACHINE

Masso Sato, Sagamihara; Tsuneo Aizawa, Isehara; Kenji Ohnishi, Sagamihara; Shigeo Koizumi, Hatano; Akio Fukuda, Yokohama; Shinki Kikuchi, Sagamihara, and Shichiro Kusanagi, Isehara, all of Japan, assignors to Amada Company Limited, Isehara, Japan

Division of Ser. No. 159,625, July 6, 1971, Pat. No. 3,754,490. This application June 11, 1973, Ser. No. 368,993
Int. Cl. B23d *53/00, 55/04*
U.S. Cl. 83—818 **1 Claim**

1. A horizontal band saw machine having a band saw trained in endless fashion about a driving wheel and a follower wheel, comprising a shaft movable along the axial direction of said wheels, a sliding piece acting as a supporting member for said follower wheel, a handle provided at each end of said shaft, a flange provided between said shaft ends, said shaft being provided in an interrelated manner with a ring member which abuts on one side said flange and is rotatable about said shaft, a tapered ring slidably attached to said shaft and a resilient member, said members being arranged in an interrelated manner so that said resilient member is compressed by

said tapered ring as said shaft is moved in the direction to increase the tension of the band saw, and bell cranks pivotally connected to one section of said ring member, one end of said



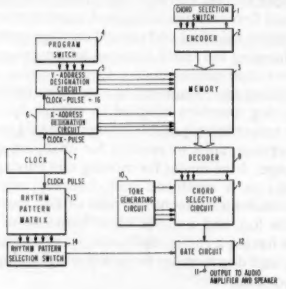
bell cranks being arranged to contact one side of said tapered ring, and another end of said bell cranks being arranged to contact a tapered face provided at said one side of the tapered ring.

3,889,568

AUTOMATIC CHORD PERFORMANCE APPARATUS FOR A CHORD ORGAN

Toshiyuki Amaya, Tokyo, Japan, assignor to Pioneer Electric Corporation, Tokyo, Japan

Filed Jan. 31, 1974, Ser. No. 438,515
Int. Cl. G10h *1/00, 5/00*
U.S. Cl. 84—1.01 **8 Claims**



1. An automatic chord performance apparatus for a chord organ comprising:

a. chord selection switch means on said chord organ permitting a player to preselect chord information in accordance with a musical composition to be performed, said chord information including both chord pattern and chord tone;

b. memory means for storing said chord information as a plurality of musical phrases, each of said musical phrases comprising a plurality of bars of said musical composition;

c. program means for storing the sequence of musical phrases to be played back in accordance with chord patterns of said musical composition;

d. address means controlled by said program means and connected to said memory means for reading out said chord information;

e. tone generating means; and

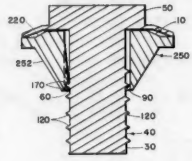
f. chord selection circuit means responsive to the chord information read out of said memory means for controlling the output of said tone generating means to reproduce chord signals.

3,889,569

SEALING WASHER FOR HIGH TORQUE SPINNING BOLT-HEAD OUTDOOR USES

Anthony Fanciullo, 808 Fifth St., North, Bellevue, Nebr. 68005

Substitute for Ser. No. 210,676, Dec. 22, 1971, abandoned, Continuation-in-part of Ser. No. 2,117, Jan. 22, 1970, abandoned. This application Sept. 5, 1973, Ser. No. 394,466
Int. Cl. F16b *29/00, 43/00*
U.S. Cl. 85—1 JP **13 Claims**



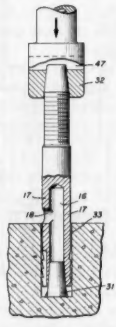
1. A weather resistant sealing washer for outer wall or roof uses, said sealing washer being of thermoplastic material having an opening therethrough for receiving the shank of a bolt, said washer being very slick for use in application beneath a bolt-head which is spun while being tightened at a high torque, said washer material having a durometer range of 50 to 85 shore, said washer having an upper end and a lower end, said washer having an axis extending through a center of said washer opening, said washer having a lower section which has an outer surface tapering from a lower portion of lesser diameter to an upper portion of greater diameter so as to wedge into an opening in a work-piece, said washer having an upper section and having an intermediate flange section disposed between said upper and lower sections, the uppermost part of said upper section being of substantially consex configuration and of a lesser diameter than the maximum diameter of said intermediate section.

3,889,570

SELF-DRILLING ANCHOR DEVICE

Constantine D. Polos, 1955 Cheshire Ln., Wheaton, Ill. 60187

Filed Feb. 16, 1973, Ser. No. 333,162
Int. Cl. F16b *13/04*
U.S. Cl. 85—68 **1 Claim**



1. An anchor device comprising in combination a member having an elongated generally cylindrical body,

a cutting head at one end of said body, said cutting head comprising a plurality of identical teeth uniformly spaced about the circumference of said body, said teeth being partially defined by a plurality of identical V-shaped radial grooves symmetrically spaced about the circumference of said cutting head, each tooth having a triangular planar end surface, all of said planar end surfaces lying in

the same plane perpendicular to the longitudinal axis of said body member,

said cutting head being provided with a plurality of longitudinal grooves in the wall of said body, permitting radial expansion of said head,

a longitudinal bore defining a wall in said body extending from said cutting head along a portion of the length of said body, said wall being provided with a plurality of external annular teeth adjacent said cutting head,

a solid conically tapered head at the other end of said body adapted to be received in the chuck of a hammer,

a cylindrical opening in the wall of said body communicating with the bore thereof, said opening being located between said solid head and said external annular teeth, and

a tapered plug adapted to be driven into the bore of said cutting head to cause radial expansion thereof.

3,889,571

MANUFACTURE OF SAFETY FUSE

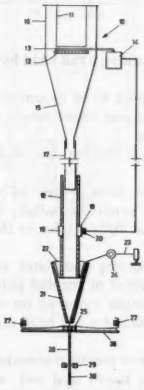
Josef Erasmus Coetzee, Edleen, South Africa, assignor to AE&CI Limited, Johannesburg, Transvaal, South Africa

Filed Dec. 4, 1973, Ser. No. 421,672

Claims priority, application South Africa, Dec. 7, 1972, 72/8668

Int. Cl. F42b *33/02*

U.S. Cl. 86—1 R **10 Claims**



1. A method of producing safety fuse having a core of incendiary powder including the steps of charging discrete quantities of incendiary powder into a tubular hopper, delivering incendiary powder from the tubular hopper into a spinning cup at a rate of flow governed by the rate of flow of incendiary powder from the spinning cup while simultaneously replenishing the mass of incendiary powder in the tubular hopper by said discrete quantities to maintain substantially a constant head of incendiary powder in the tubular hopper, passing at least one thread through the incendiary powder in the spinning cup at an angle to the vertical axis of the cup, feeding the incendiary powder and the thread from the spinning cup to a spinning die, forming a covering sheath around the incendiary powder and the thread, counter spinning the sheath with another layer of yarn to produce a semi-fuse, and finishing the semi-fuse to provide safety fuse having a core of incendiary powder.

3,889,572

FIREARM CONSTRUCTION

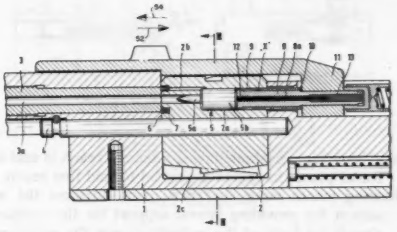
Ludwig Vorgrimler, and Gerhard Hupp, both of Oberndorf, Neckar, Germany, assignors to Industrie-Werke Karlsruhe Augsburg AG, Germany

Filed May 25, 1973, Ser. No. 363,795

Claims priority, application Germany, Sept. 23, 1972, 2246854

Int. Cl. F41d *7/04*

U.S. Cl. 89—155 **13 Claims**



1. A firearm, particularly a short hand firearm for firing case-less ammunition, comprising a gun housing, a gun barrel having a gun bore therethrough and supported on said housing, a rotatable cartridge drum having a plurality of angularly spaced case-less cartridge chamber bores arranged axis parallel to the bore of said gun barrel and being rotatably supported in said housing directly adjacent the end of said gun barrel with a separation joint therebetween and in a position in which each cartridge chamber bore may be successively and separately aligned with the bore of said gun barrel upon indexing movement of said cartridge drum, packing means carried by said drum sealing the separation joint between said drum and said barrel at each firing of said cartridge, a slide on said housing movable backwardly and forwardly thereon in an axial direction in relation to said gun barrel, a breech block mechanism carried by said slide including a cylindrical member movable into a cartridge chamber bore which is aligned with the bore of said gun barrel to advance a cartridge therein into the bore of said cartridge chamber and forming a seal with said cartridge chamber bore behind the cartridge, locking means defined between said slide and said drum for holding said drum in a position with a cartridge chamber bore aligned with the bore of said gun barrel for firing, and cartridge misfire ejection means carried by said slide and movable therewith to eject a blind cartridge, said breech mechanism including packing sleeve means arranged around said cylindrical member, said sleeve means having first and second ends, said first end being engaged against said slide in a neutral or rest position, said second end being opposite to said first end and being adjacent said gun barrel bore and abuts against the propellant charge of the ammunition.

3,889,573

BROACHING MACHINE

Vincent J. Girardi, Grosse Pointe, Mich., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Sept. 4, 1973, Ser. No. 393,898

Int. Cl. B23d *37/18*

U.S. Cl. 90—78 **3 Claims**

1. In a broaching machine, the combination comprising

a base,

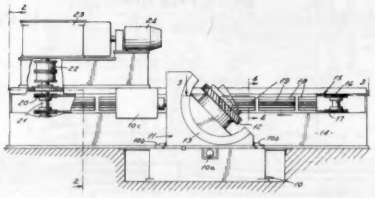
means on the base for supporting a workpiece rotatably,

said means being adapted to index the workpiece about an axis for bringing successive portions of the periphery thereof in position for broaching,

an endless broaching chain on said base mounted for movement in a plane extending substantially horizontally,

said broaching chain having carriers thereon for broaching tools,

said broaching chain having a first reach in said horizontal plane thereof that extends along the work supporting means to provide a broaching operation on the periphery of the workpiece as the tools are moved past the periphery,



said broaching machine having a second reach in said horizontal plane that extends parallel to said first reach,

bearing means along said first reach adjacent the work station for providing lateral support for the carriers to absorb the force of the broaching upon the workpiece,

and bearing means along said second reach for providing lateral support to said carriers.

3,889,574

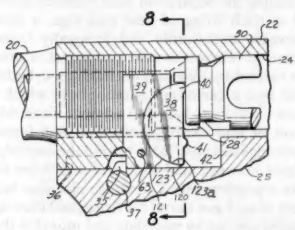
AUTOMATIC HAND GUN

Harry W. Sanford, Arcadia, Calif., assignor to T. D. E. Inc., El Monte, Calif.

Division of Ser. No. 145,259, May 20, 1971, Pat. No. 3,780,618. This application May 14, 1973, Ser. No. 360,159

Int. Cl. F41d *3/06*

U.S. Cl. 89—169 **4 Claims**



1. In an automatic pistol having a frame and a recoil-actuated bolt mounted to said frame and rotated by cam means for breech-locking with spline means, and by primary recoil energy imparted to said bolt by the recoil of a barrel and receiver assembly, having a trigger mechanism for firing, improvements which comprise:

torsion spring means, said torsion-spring means engaging the bolt and the frame of said pistol and being reacted against each of them, said torsion-spring means being preloaded by unlocking rotation of said bolt, and said torsion-spring means releasing stored energy for rotation of said bolt to breech-lock the same;

mechanical accelerator means, said mechanical accelerator means removing energy from said barrel and receiver assembly and transferring said energy by impact to said bolt, said energy transfer imparting a secondary energy input to said bolt after said breech-locking is released, said accelerator means being in the form of a segment of a disc, said disc being mounted for rotation on said movable receiver, a pair of striking faces on the accelerator means adjacent the periphery thereof, but spaced apart on opposite sides of the center of rotation thereof, one of said pair of striking faces striking a portion of said frame of said pistol at the conclusion of motion of said barrel and said receiver assembly in one direction, the other face of said pair striking said bolt at the instant of unlocking of said breech lock to impart a secondary energy transmitting impact to said bolt.

3,889,575

DEVICE FOR PROFILING THE RAIL HEAD OF VIGNOLES RAILS

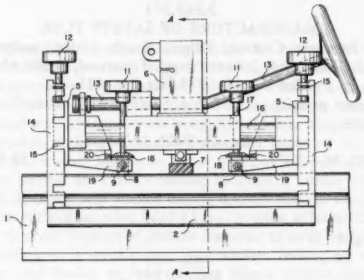
Paul Tabert, Cologne-Bayenthal, Germany, assignor to Elektro-Thermit GmbH, Germany

Filed Mar. 21, 1973, Ser. No. 343,252

Claims priority, application Germany, Apr. 7, 1972, 2216692

Int. Cl. B23c *1/20;* **B24b** *23/00*

U.S. Cl. 90—12 A **4 Claims**



1. A device for profiling a rail head having a rail head curvature comprising

frame means adapted to be mounted on a rail,

means for securing said frame means to said rail, said frame means including

two parallel plates having rail head engaging recesses therein,

a plurality of guide slots in each of said plates, said guide slots projecting generally radially from each said recess and extending at right angles to the tangents of the rail head curvature

guide means connecting said plates, said guide means being selectively mounted in parallel guide slots of said plates profiling tool means mounted on said guide means, said tool means including a rail head contacting working surface.

a pair of feeler screw means connected to said guide means and adapted to touch said rail, whereby the touching points of said feeler screw means and the working surface of said profiling tool means are maintained coplanar,

and screw means for securing said guide means in said guide slots and for forcing said feeler screw means against the rail head.

3,889,576

LOCKING CYLINDER WITH IMPROVED LOCKING STRUCTURE

Harvey I. Sheffer, and Donald A. Selke, both of Cincinnati, Ohio, assignors to The Sheffer Corporation, Cincinnati, Ohio

Filed June 13, 1969, Ser. No. 832,958

Int. Cl. F15b *15/22*

U.S. Cl. 91—394 **1 Claim**

1. In a locking cylinder having a main piston slidable in a cylinder and locking means for mechanically locking said piston with respect to said cylinder, the improvement comprising,

means defining a keeper on said main piston, said keeper projecting axially from the surface of said main piston and

being mounted thereto by means permitting the keeper to shift radially,

a latch engageable with said keeper at a predetermined locking position of said keeper and main piston to lock said keeper and main piston in said predetermined position, by restraining movement of said keeper therefrom, means mounting said latch for slidable movement angularly toward and away from said keeper for engagement of said latch therewith at said predetermined position,

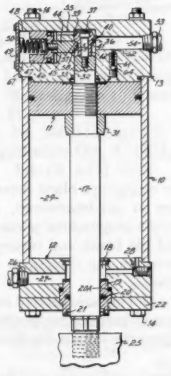
a latch piston connected to said latch to move the latch away from said keeper in response to an unlatching pressure thereon,

means biasing said latch piston radially toward said predetermined position,

a passage for applying pressure fluid from a source to said latch piston to move the latch away from said predetermined position,

a port through which pressure fluid from said source must flow to act on the full area of said main piston,

a blocking piston mounted to said main piston, said blocking piston having a crosswise area which is substantially



less than the full area of the main piston; said crosswise area exposed to pressure fluid from said source which tends to move said main piston away from said predetermined position, said blocking piston cooperating with said port when said latch is engaged with said keeper to close said port to flow therethrough, the application of pressure to the full area of the main piston being blocked until said latch has been disengaged from said keeper and said main piston has moved away from said predetermined position sufficiently that said blocking piston no longer closes said port,

said latch having an inclined cam surface which bears on a cooperating inclined cam surface provided on said keeper in said locking position, the cam surfaces being such that the unlocking camming force applied by said keeper to said latch when engaged therewith is insufficient to overcome the opposed frictional and biasing forces that restrain cammed movement of said latch, but sufficient in combination with the force of said pressure fluid on said latch piston to move said latch piston and latch radially away from said keeper.

3,889,577

PRESSURE-RESPONSIVE CONTROL BODY FOR USE IN FLUID HANDLING DEVICES

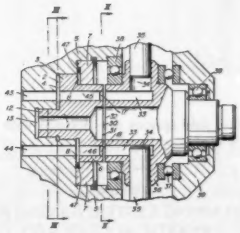
Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 239,551, March 30, 1972, Pat. No. 3,831,496. This application Jan. 8, 1973, Ser. No. 321,853

Claims priority, application Austria, Jan. 5, 1972, 57/72

Int. Cl. F01b *13/06*

U.S. Cl. 91—487 **11 Claims**



1. In a fluid handling device, a combination comprising a housing having inlet and outlet parts for admission and evacuation of fluid; a rotor mounted in said housing and having a first control face at one axial end thereof, a plurality of working chambers and first passages extending between said working chambers and said first control face; and a control body axially movably received in said housing and having a second control face adjacent to and defining with said first control face a narrow control clearance, said body including at least one larger-diameter first cylindrical portion coaxial with said rotor and at least one smallerdiameter second cylindrical portion which is eccentric with respect to said rotor and extends in part radially beyond at least one of said control faces, said cylindrical portions having end faces facing away from said rotor and defining with said housing two fluid-filled pressure chambers communicating with said ports whereby the fluid in at least a portion of at least one of said chambers urges said body toward said rotor, said body further having second passages alternatingly connecting said first passages with said inlet and outlet ports when said rotor rotates in said housing, said control clearance including two pressure zones each having a first gravity center and each of said pressure chambers having a second gravity center, each of said gravity center being radially spaced from the axis of said rotor and each of said second gravity centers being aligned with one of said first gravity centers.

3,889,578

AXIAL PISTON ROTARY BARREL TYPE HYDRAULIC PUMPS OR MOTORS

Robert Cecil Clerk, Edison House, Fullerton Rd., Glenrothes, Fife, Scotland

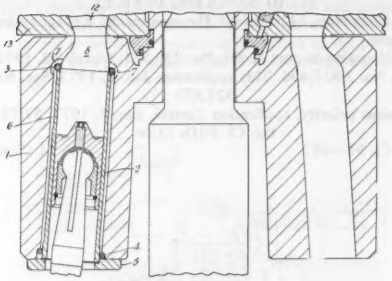
Filed June 15, 1973, Ser. No. 370,345

Int. Cl. F01b *13/04*

U.S. Cl. 91—499 **4 Claims**

1. An axial piston rotary barrel type hydraulic pump/motor having a cylinder barrel including a plurality of substantially axially aligned cylinder bores each of which includes a cylinder port in one end communicating with a working fluid transfer port in a stationary valve block, each of said bores being fitted with a cylinder liner sealed at both of its ends to said bore, the outer diameter of said liner being substantially less than the inner diameter of said bore, to provide a free annular space between the inner wall of the bore and outer wall of the liner, and channels connecting said annular spaces to said

cylinder ports whereby said annular space is entirely closed except for communication with said cylinder port through said



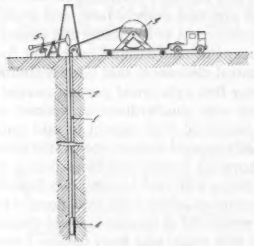
channels, so that said spaces are flooded with and subject to the pressure of said working fluid.

3,889,579

OIL WELL PUMPING SYSTEM HAVING REINFORCED PLASTIC SUCKER ROD

Joseph W. Wiechowski, San Clemente; Delmar S. Miller, Newport Beach, and Richard C. Kostner, Orange, all of Calif., assignors to Poly-Trusions, Inc., Santa Ana, Calif.

Filed Jan. 7, 1974, Ser. No. 431,124
Int. Cl.[2] F04B *17/00, 47/02*
U.S. Cl. 92—3 **12 Claims**



1. A pumping system for oil wells and the like which comprises a pump in a well near the bottom thereof, a pump drive near the top of the well, and a sucker rod drive connecting the drive to the pump, the improvement wherein:

the sucker rod is of sufficient length to reach from the drive to the pump, said rod being constructed of a multiplicity of glass fibers bonded together into a semi-rigid rod by a set organic resin; and

fittings affixed at the respective ends of the sucker rod for connection to the pump and to the drive respectively.

3,889,580

METHOD AND APPARATUS FOR AUTOMATIC FOLDING OF A SPACE DIVIDER

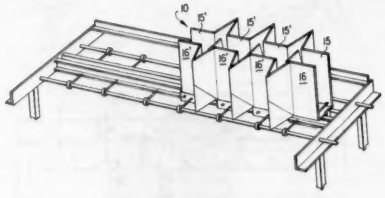
Frederick Garst, Boones Mill, Va., assignor to Occanneechi Orchards, Inc., Boones Mill, Va.

Filed May 14, 1974, Ser. No. 469,774
Int. Cl. B31b *1/52*
U.S. Cl. 93—37 SP **24 Claims**

1. An apparatus for folding a generally planar blank into an erected position to form a space divider including at least two bottom panels disposed centrally of and spaced longitudinally of the blank and respectively corresponding side panels joined to each bottom panel along longitudinal fold lines, connecting panels joining corresponding successive side panels and a centrally disposed partition panel connected at its base to a second of said bottom panels and having a pair of laterally extending shoulders connected to a first foldable section of each corresponding connecting panel along diagonal fold lines, said blank being adapted to be folded into an erected position with successive bottom and associated side panels disposed in adjacent positions, separated by a corresponding central partition panel and associated connecting panels,, with the shoulders of each partition panel sandwiched between the foldable sections of the associated connecting panels, comprising

first means for engaging respectively corresponding bottom panels or a blank received on said apparatus for folding, and being movable relatively to each other from initial, displaced positions corresponding to the displacement between the bottom panels of the blank prior to folding to adjacent positions corresponding to the adjacent positions of the bottom panels in the erected divider,

first means for moving said engaging means relatively to each other simultaneously and while maintaining uniform spacing therebetween, from said initial to closed positions,



second means for engaging a blank received on said apparatus for folding at predetermined, displaced positions along the opposite longitudinal portions thereof for initiating folding of the blank and biasing of the panels and partitions thereof in the directions of their respective, erected positions,

second means for moving said second engaging means from normally lowered, inoperative positions to raised positions for engaging the longitudinal portions of the blank, and

means for selectively and automatically actuating said first and second moving means simultaneously for moving said first engaging means from said initial positions to said closed positions thereof and for raising said second engaging means, and responsive to a predetermined extent of movement of said first engaging means to actuate said second moving means to lower the second engaging means while said first moving means continues the movement of said first engaging means to the closed positions thereof.

3,889,581

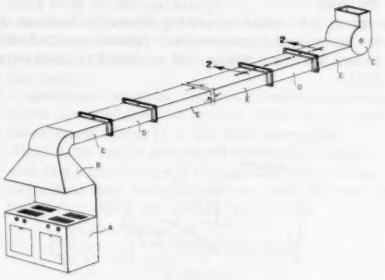
DUCTED GREASE VAPOR EXHAUST SYSTEM

William W. Bray, Sr., 1423 Bethlehem Pk., Ambler, Pa. 19002

Filed Feb. 25, 1974, Ser. No. 445,094
Int. Cl. B01d *47/06*
U.S. Cl. 98—115 K **5 Claims**

1. A duct system for conducting grease-containing vapors from a cooking stove which comprises in combination, a hood and an essentially horizontal duct attached to said hood to permit entry of vapors, said duct being terminated by a fan to draw said vapors through said duct system, said duct consisting of sections of a double walled conduit having thermal insulation between the walls, said inner conduit being impervious to vapor leakage, and said duct consisting of removable sections interspersed between fixed non-removable sections, said removable sections abutting said non-removable sections

to thereby provide access to the interior of the duct, the butted ends being fitted with a thermally insulating and



grease-vapor impervious gasket to provide a fully insulated and leak-proof system.

3,889,582

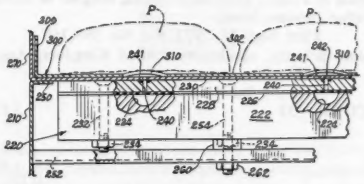
STEAM INJECTOR SPATULA

Chester J. Binks, La Grange, and Joseph M. Moser, Des Plaines, both of Ill., assignors to Restaurant Technology, Inc., Oak Brook, Ill.

Division of Ser. No. 240,348, April 3, 1972, Pat. No. 3,794,016. This application Oct. 9, 1973, Ser. No. 404,179

Int. Cl. A47j *36/20*

U.S. Cl. 99—450 **2 Claims**



1. A bun spatula adapted to be positioned in a steam injector in which steam is injected upwardly towards said spatula, said spatula comprising an expansive planar base member and a handle, said planar base member defining a plurality of steam diffusion passages which are arranged in rows and columns and which are equidistantly spaced from each other in rectilinear directions, each steam diffusion passage comprising an aperture in said planar base member, which, when viewed in plan view, comprises a pair of narrow open aperture sections spaced apart laterally by a diffuser member, said diffuser member being elongate and being integral at its ends with said base member, said diffuser member rising from its ends towards the center to provide a crowned configuration with the lower surface of said diffuser member being spaced upwardly of the lower surface of said base member, thereby to elevate bun portions centrally with respect to said planar base member, so that as steam is injected upwardly to enter an overlying bun portion, the steam may strike the diffuser member and will then diffuse laterally to pass upwardly through the adjacent aperture sections into an overlying bun portion without producing a skin effect above the steam diffusion passages.

3,889,583

CASHEW UNSHELLING APPARATUS

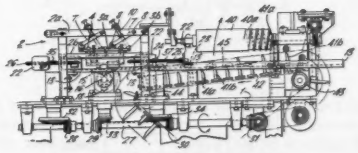
Nobuhiko Mizuno, Tokyo, and Hideo Wakai, Fujimi, both of Japan, assignors to Cashew Company, Ltd., Tokyo, Japan

Filed July 9, 1973, Ser. No. 377,583

Claims priority, application Japan, Mar. 26, 1973, 48-33489

Int. Cl. A23n *5/00*

U.S. Cl. 99—576 **1 Claim**



1. A cashew unshelling apparatus wherein the cashews are constantly moving during the unshelling operation, comprising:

a horizontal elongated guide member having a groove of triangular cross-sections formed longitudinally in the upper surface thereof and a slit formed at substantially the center of the length thereof along the bottom of said triangular groove;

upper and lower frames arranged vertically in two stages above said slit;

a cutting blade supporting means vertically movably mounted on and extending through said lower frame with the lower portion thereof suspended from said lower frame to a level immediately above said slit;

a spring interposed between the upper portion of said cutting blade supporting member and said upper frame for urging said supporting member downwardly; a spindle;

a noncontinuous lower rotary cutting blade connected to said spindle arranged immediately below said slit and extending at right angles to said guide member, the cutting edge of said lower rotary cutting blade moving into and out of said slit during rotation of said spindle;

a Y-shaped upper cutting blade connected to the lower end face of said supporting member in parallel to said guide member and with the Y-shaped bifurcated portion thereof extending downstream with respect to the moving direction of said cashews; a chain

pushing members connected to said chain with a large separation between adjacent pushing members and carried thereby for feeding cashews to a position between said upper and lower cutting blades, said cashews being placed in said triangular groove with the convexed backs upside, said cashews being constantly moved by said pushing members during the unshelling operation;

driving chain wheels for driving said chain and coupled thereto, said chain and said driving chain wheels constituting a guide mechanism for advancing said pusher members along the triangular groove; and

means operatively coupled for synchronizing the time when each of said pusher members reaches said slit and the time when said lower rotary cutting blade protrudes from said slit.

3,889,584

BINDING MACHINE

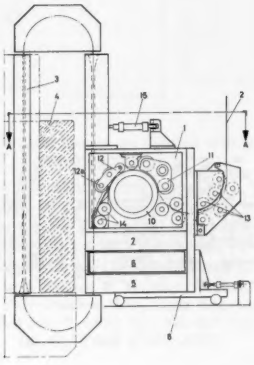
Olof Bruno Wiklund, Bergeforsen, Sweden, assignor to Sunds Aktiebolag, Sundsvall, Sweden

Filed Sept. 25, 1973, Ser. No. 400,677

Claims priority, application Sweden, Oct. 17, 1972, 13398/72

Int. Cl. B65b *13/04*

U.S. Cl. 100—26 **4 Claims**



1. A binding machine for binding bundles of wire rod material by binding with wire, comprising a device for feeding and stretching the wire, the wire being fed through assemblies arranged consecutively in series for cutting (**7**), twisting (**6**), clamping (**5**) and a track (**3**) for guiding the wire around a bundle of rods (**4**) to be bound, said cutting assembly (**7**) and said twisting assembly (**6**) also being adapted to guide the wire subsequent to its feed around such bundle into said clamping assembly (**5**) which latter is adapted to stop and clamp the free wire end, said clamping end, respectively, cutting assembly (**5** and **7**, respectively) comprising a pair of clamping and, respectively, cutting tools (**16, 20** and, respectively **31, 34**) and guide grooves (**18** and, respectively, **33**) for the wire, which guide grooves also serve as thrusts and for longitudinally defining the tie during the twisting of the wire in the twisting assembly (**6**), which comprises a rotary twisting roller (**23**) having a radial slot (**24**) for twisting the wire strands, in which organization said guide grooves (**18, 33**) are arranged transverse to the plane of said wire guide track (**3**) and have recesses (**17, 32**) at one end open to said bundle (**4**), the twisting assembly (**6**) besides the twisting roller (**23**) also including an openable wire guide cover (**22**) provided with wire passages, which in the wire feed are disposed directly in front of the guide grooves (**18, 33**), the twisting assembly being movable between a wire feed position and a twisting position, said cover (**22**) being adapted upon the movement of the twisting assembly to open to pass out the wire strands and upon return movement to expose the completely twisted tie by pushing it from the guide grooves (**18, 33**) out into the recesses (**17, 32**).

3,889,585

LOAD-BUNDLING AND STRAPPING APPARATUS

A. Elmo Morrow, Portland, Oreg., assignor to Mac-Fab Manufacturing, Inc., Portland, Oreg.

Filed May 8, 1974, Ser. No. 467,931

Int. Cl. B65b *13/04*

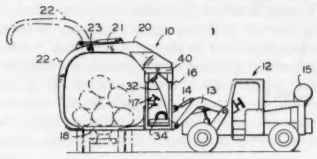
U.S. Cl. 100—26 **20 Claims**

1. An elongate load-bundling and -strapping attachment for a materials handling vehicle, said attachment comprising:

vertically extending frame means adapted for attachment to the load-handling mechanism of said vehicle rearwardly of the load,

a lower jaw means projecting forwardly from a lower portion of said frame means and adapted to extend beneath the load,

an upper jaw means projecting forwardly from an upper portion of said frame means in vertically spaced relation to said lower jaw means and adapted to extend over the load,



movable jaw means pivoted at one end thereof to a forward end portion of said upper jaw means for generally vertical pivoting movement, said movable jaw means being pivotable between a raised open position enabling positioning of said upper and lower jaw means above and below the load and a lowered closed position wherein said movable jaw means extends downwardly from said upper jaw means to said lower jaw means to contain the load,

and track means along the inner circumference of said upper, lower and movable jaw means for guiding a binding strap about the load, said track means being continuous from one said jaw means to the others when said movable jaw means is closed.

3,889,586

CONTROL FOR FLUID PRESSURE ACTUATORS

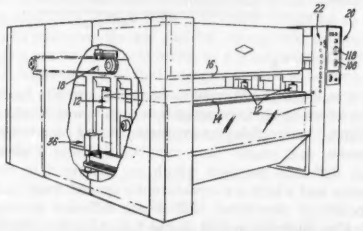
Frederick A. Pretty, Alveston, England, assignor to USM Corporation, Boston, Mass.

Filed Aug. 21, 1973, Ser. No. 390,250

Claims priority, application United Kingdom, Aug. 24, 1972, 39461/72

Int. Cl. B30b *15/16*

U.S. Cl. 100—53 **3 Claims**



1. In a press having a movable platen which is driven by fluid piston and cylinder means against a relatively fixed platen, a system for supplying and controlling fluid under pressure to the piston and cylinder means comprising:

A. a first pump connected to supply pressurized fluid to the piston and cylinder means at low pressure and high volume;

B. a second pump connected to supply pressurized fluid to the piston and cylinder means at high pressure and low volume;

C. a conduit connected to receive the pressurized fluid from both pumps and for directing said fluid to the piston and cylinder means;

D. first valve means connected to the first pump and the conduit to divert fluid from said pump away from said conduit when the pressure in the conduit reaches a predetermined value, thereby allowing further movement of the movable platen to be caused solely by the pressurized fluid from the second pump;

E. mechanically actuated second valve means associated with the piston and cylinder means to control the flow of pressurized fluid from the conduit to the piston and cylinder means;

F. a mechanical assembly operatively associated with a lead screw for actuating the second valve means, said lead screw being driven by a first fluid motor; and

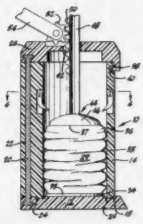
G. third valve means connected to the first pump to cause said first pump to supply low pressure, high volume fluid to the first fluid motor in order to drive said lead screw, thereby actuating the second valve means.

3,889,587

CAN CRUSHER

Franklin Eugene Wharton, Torrance, Calif., assignor to William F. McDonald, a part interest

Filed July 5, 1973, Ser. No. 376,439
Int. Cl.[2] B30B *9/00*
U.S. Cl. 100—98 R **7 Claims**



1. A device for crushing cans wherein the junctures of the top and the sidewall and the bottom and the sidewall are stronger than the sidewall which comprises:

a. a base,

b. a hollow cylinder open at both its upper and lower ends mounted at its lower end on the base and having a length greater than the can and an inside diameter slightly greater than the outside diameter of the can and having a strength sufficient to contain and restrain the can while it is being crushed:

c. at least one blade resiliently mounted in the side of the cylinder and having a cutting edge thereon extending inwardly thereof a short distance, the plane of the cutting edge of the blade comprising a radius of the cylinder, so as to longitudinally slit the sidewall of the can as it is inserted into the cylinder starting at the upper end thereof and moves past the blade;

d. A piston having a diameter such that it can pass through the cylinder without touching the blade and adapted to press down on the can within the cylinder;

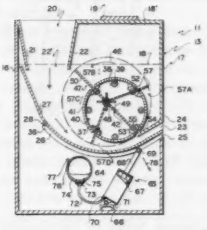
e. means for moving the piston longitudinally within the cylinder from a position near the upper end to a position near the lower end so as to crush the can, the inside surface of cylinder restraining expansion of the can as it is crushed so that the can sidewall is forced to collapse inwardly, whereby there will be a minimum of exposed sharp edges on the crushed can.

3,889,588

MATERIAL COMPACTING DEVICE

Philip Wollersheim, 3016 14th St., S.W., Calgary, Canada

Continuation-in-part of Ser. No. 235,550, March 17, 1972, abandoned. This application Oct. 5, 1973, Ser. No. 403,845
Int. Cl. B60p *1/00*
U.S. Cl. 100—177 **4 Claims**



1. A material compacting device for use in conjunction with a storage container such as a truck; comprising in combination an outer casing, an arcuately curved shroud mounted in said casing, an intake hopper in said casing and an ejector outlet in said casing, said shroud extending between said hopper and said outlet, a drum journalled for rotation transversely within said casing and being situated towards said outlet, the peripheral wall of said drum being in close proximity with the concave inner surface of said shroud, a source of power operatively connected to said drum for rotating same and a set of compression vanes, means in said casing to mount said vanes, said means being eccentric to the transverse axis of said drum, said vanes extending through the peripheral wall of said drum and extending and retracting relative to said peripheral wall of said drum as said drum rotates, adjacent vanes, the portion of said peripheral wall therebetween and said shroud defining chambers, the volume of which decreases towards said ejector outlet as said drum and vanes rotate, said shroud being pivotally mounted to said casing by one end thereof adjacent said hopper and adjustable means adjacent the other end thereof normally biassing said shroud towards said drum thereby controlling the compaction of material within said chambers, said means normally biassing said shroud towards said drum including a fluid operating piston and cylinder assembly operatively extending between said shroud and said casing and an accumulator in said casing operatively connected to the cylinder of said piston and cylinder assembly.

3,889,589

CONTAINER ADAPTER FOR REFUSE COMPACTOR

Ira J. Jackson, Overland Park; Thomas F. O'Connor, Fairway, and James H. Buckley, Overland Park, all of Kans., assignors to Trans-World Compacters, Inc., Overland Park, Kans.

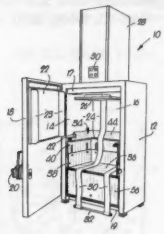
Filed Apr. 25, 1974, Ser. No. 463,878
Int. Cl. B30b *15/32*
U.S. Cl. 100—218 **9 Claims**

1. A container adapter for use with a refuse compactor of the type having a compaction chamber for enclosing a relatively large refuse container, and a reciprocable platen operable to compact refuse deposited in said container, said adapter permitting use of a smaller refuse container with said compactor and comprising:

a generally horizontal seat of dimensions permitting positioning thereof within said chamber, said seat being adapted to support said smaller refuse container thereon within said chamber; and

spaced upright sidewalls connected to said seat, each of said sidewalls having inwardly extending lip structure thereon for cooperatively defining with said seat and sidewalls a

compartment for said smaller refuse container,



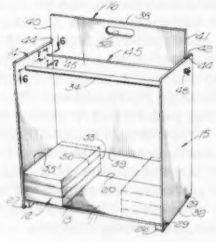
said compartment being of dimensions precluding significant horizontal and vertical movement of said smaller refuse container when the latter is positioned therewithin.

3,889,590

PADDING RACK

Robert N. Juarez; Jean Juarez, both of 1202 Tressy, Glendora, Calif. 91740, and Wesley E. Buford, 1042 Wingate, Covina, Calif. 91723

Filed May 24, 1974, Ser. No. 473,130
Int. Cl. B30b *1/04*
U.S. Cl. 100—219 **15 Claims**



1. A padding rack comprising:

a base having a surface on which a stack of paper sheets are to be supported;

a dual purpose paper contacting structure; and

means for mounting said structure selectively either in a first paper locating position relative to said base or a second adhesive applying position relative to the base;

said structure, in said first position thereof, being positioned to engage corresponding edges of the sheets of said stack and limit movement thereof in a predetermined direction in a relation aligning said edges relative to one another, but being movable out of engagement with said aligned edges in said second position of the structure to expose said aligned edges for application of adhesive thereto;

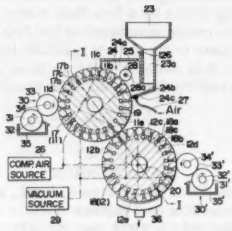
said structure, in said second position thereof, being engageable against an upper sheet of said stack in a relation clamping said stack between said structure and said base to lock the sheets in aligned positions during application of adhesive thereto.

3,889,591

METHOD AND APPARATUS FOR PRINTING INDICIA ON PRODUCTS

Yukihide Noguchi, Osaka, Japan, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Nov. 26, 1973, Ser. No. 419,200
Claims priority, application Japan, Nov. 28, 1972, 47-119512; Nov. 28, 1972, 47-137236
Int. Cl. B41f *17/36*
U.S. Cl. 101—37 **10 Claims**



1. A branding machine for successively reproducing indicia on a mass of products of similar shape and/or size, which comprises in combination:

a support structure;

at least one rotary drum rotatably carried by said support structure and having the peripheral surface formed with a plurality of radially inwardly recessed receptacles, some of which successively receive therein a corresponding number of the products during each rotation of said rotary drum for transference of said products from a take-in position to a take-out position, said receptacles being arranged in at least one circumferentially extending row in equally spaced relation with respect to each other; means operatively coupled for continuously driving said rotary drum in one direction;

means disposed adjacent said rotary drum at said take-in position for accommodating therein the mass of said products charged thereinto;

a source of compressed air;

a vacuum source;

first means for permitting a first group of said some of said receptacles to be communicated with said vacuum source for sucking therein a corresponding number of said products;

second means for permitting a second group of said some of said receptacles to be communicated with said compressed air source for effecting a posture correction of each of a corresponding number of said products by floating said product in air within the associated receptacle;

third means for permitting a third group of said some of said receptacles to be communicated with said vacuum source for enabling a corresponding number of said products to be printed with said indicia thereon;

fourth means for permitting the rest of said some of said receptacles to be communicated with said compressed air source for successively ejecting a corresponding number of said products onto a subsequent processing station,

said first to fourth means being operatively coupled and operated simultaneously during each rotation of said rotary drum;

means disposed adjacent said rotary drum and substantially opposed to said accommodating means for printing the indicia on one surface of each of said products, which is exposed outside the associated receptacle, during transference thereof past said third means; and

means operatively coupled for driving said printing means in a direction counter to the direction of rotation of said

rotary drum and in the same peripheral velocity as that of said rotary drum.

3,889,592

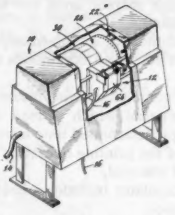
COMPUTER RESPONSIVE SUPPLEMENTAL PRINTER

Raymond R. Lupkas, Trumbull; Gerald C. Freeman, Norwalk, and Frank T. Check, Jr., Orange, all of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Division of Ser. No. 195,729, Nov. 4, 1971, Pat. No. 3,832,946. This application July 9, 1973, Ser. No. 377,234

Int. Cl. B41j *3/50, 3/02*

U.S. Cl. 101—93.47 5 Claims



1. A postage metering system for printing postage indicia, comprising in combination a computer output printer and a supplemental postage printer operatively connected to, and controlled by, a postage accounting means, said supplemental postage being mounted upon said computer output printer, said supplemental postage printer having a secured housing containing segmental postage printing dies each of which is individually translationally movable between a non-printing position and a printing position, each die containing on a printing surface thereof a portion of a postage insignia, and certain of said dies comprising variable numerical printing modules which are electrically controlled to vary a numerical postage printing amount to be printed, said dies acting in combination with each other during printing to form a complete postage mark containing a postage insignia and a postage amount, and drive means operatively and individually connected to each of the respective printing dies to move said postage printing dies from the non-printing position towards the printing position, said drive means moving each of said dies in a sequential relationship to provide improved print quality.

3,889,593

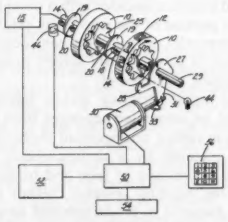
ELECTRIC-SET NUMBERING WHEEL

Charles W. McVey, Eastlake, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed June 26, 1973, Ser. No. 373,821

Int. Cl. B41j *5/00*

U.S. Cl. 101—110 5 Claims



1. A number set device for use with a controller in establishing a number series in a data printer, comprising:

at least two number wheels each having a plurality of equal angular spaced indicia in a series about the periphery thereof;

a shaft, with drive means for rotating said shaft, and each wheel journaled on said shaft;

a slip clutch for each wheel coupling said wheel to receive a drive urge from the shaft;

an energy source;

each wheel being an insulator to transmission of energy from said source with restricted areas conductive to energy from said source;

said restricted conductive areas being in an equal angular spaced series corresponding one for one to said indicia series and all wheels being identical in such spacing, whereby all transmission areas are aligned whenever a print indicia of each wheel is in the said number series positions for printing, and one or more of said wheels may rotate while others may be held fixed in position and a new complete transmission series will become aligned regardless of the number of wheels turning or stopped when the drive means rotates said shaft a rotary angle equal to the angular spacing of said conductive restricted areas;

an energy responsive means positioned to be pulsed upon alignment of a set of said restricted areas;

brake means for locking each wheel separately in any one of the number of positions of the indicia alignment;

whereby each alignment of the energy transmission areas will produce a pulse which is counted by said controller, and the brake means for any wheel to be stopped at each rotary pulse position is set by said controller to lock the selected indicia in said print alignment.

3,889,594

HAND-HELD SELF-ADHESIVE-LABEL APPLICATORS

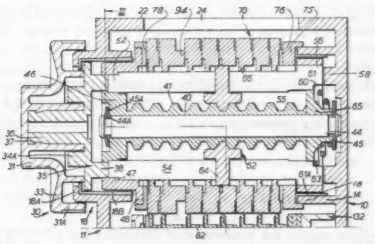
Brian Nicholson, Boston, England, assignor to Norprint Limited, England

Filed July 10, 1973, Ser. No. 378,031

Claims priority, application United Kingdom, July 11, 1972, 32321/72

Int. Cl. B41j *3/08*

U.S. Cl. 101—111 12 Claims



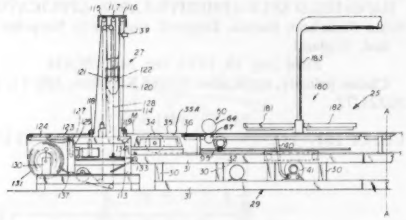
1. In an adjustable facet print mechanism, a plurality of print-facet carrying bands, each said band having a plurality of print-facets, selected ones of which are operative at any given time; a plurality of first wheels arranged on a common axis, each wheel having an internal array of projections and carrying a series of characters each corresponding to a respective print-facet of a related print band and providing an indication by display of the character corresponding to the then operative print-facet of said related print band; a plurality of second wheels arranged on a common axis parallel to the axis of the first wheels and each serving in part to support a respective print band; means supporting said bands at a position spaced from said second wheels and providing backing surfaces for the print-facets of the bands operative at any given time; means drivingly connecting corresponding first and second wheels; a screw-threaded member rotatable on a com-

mon axis of said first wheels and lying within said first wheels; stationary means rotatably supporting said screw-threaded member; a nut member carried by the screw-threaded member and having an array of projections on its periphery; a rotatable spider member coaxial with said screw-threaded member and having a plurality of arms extending axially of said screw-threaded member and interdigitating with at least some of said projections of said nut member; means operable to prevent rotation of said spider member; and a single rotatable actuating member, movable axially of said screw-threaded member over a distance substantially less than the axial length of said plurality of first wheels, operative selectively, in a first axial position, to drive said screw-threaded member with the means operable to prevent rotation of said spider member operative, whereby to move said nut member to a position whereat the projections thereof mesh with the internal projections of a selected first wheel and, in a second axial position, to drive said screw-threaded member with the means operable to prevent rotation of said spider inoperative, whereby to rotate said nut member and spider together to index the selected first wheel and associated print band to bring a required print facet to an operative position.

3,889,595
CONTINUOUS ROTARY SCREEN PRINTING METHOD AND APPARATUS

David Jaffa, Fairlawn, N.J., assignor to Precision Screen Machines Inc., Hawthorne, N.J.

Filed July 3, 1972, Ser. No. 268,522
Int. Cl. B41l *13/16;* **B41f** *15/10, 15/24*
U.S. Cl. 101—116 **11 Claims**



1. A rotary screen printing apparatus comprising:
a surface for supporting the material to be printed,
a rotating printing screen disposed adjacent said surface,
means for effecting a relative movement of said surface and said screen between a printing and non-printing position,
means for moving said surface and material supported thereon relative to said screen in a direction of feed during the printing thereof,
drive means for rotating said screen in the printing position thereof relative to said surface to effect continuous printing of the material,
means for reversing the direction of travel of said surface and material thereon, upon the termination of a printing operation, and
means for reversing the rotation of said screen in the non-printing position thereof upon the termination of said printing operation,
wherein said means for effecting relative movement of the screen and surface between a printing and non-printing position include timing means for moving said screen into printing position onto the material whereby the screen effects engagement of said material on the trailing end portion of a print thereon in commencing a printing operation to overlap a portion of a preceeding printed portion of the material to eliminate any demarkation between successive prints on said material.

5. A rotary screen printing apparatus comprising:
a surface for supporting the material to be printed,
a rotating printing screen disposed adjacent said surface,
means for effecting a relative movement of said surface and said screen between a printing and non-printing position,
means for moving said surface and material supported thereon relative to said screen in a direction of feed during the printing thereof,
drive means for rotating said screen in the printing position thereof relative to said surface to effect continuous printing of the material,
means for reversing the direction of travel of said surface and material thereon, upon the termination of a printing operation, and
means for reversing the rotation of said screen in the non-printing position thereof upon the termination of said printing operation,
an infeeding accumulator discussed adjacent said supporting surface for feeding a continuous strip of material to said surface,
said infeeding accumulator having means storing a supply of continuous material which is feed to said supporting surface for a predetermined time interval to prohibit any interruption of the printing operation during the set of a new supply of material,
said infeed accumulator includes a holding table having a vacuum chamber,
means for drawing a vacuum on said holding table to secure the trailing end portion of a continuous sheet of material to said holding table,
means adjacent said holding table for supporting the leading end of another supply roll of said material to said trailing end portion to facilitate the joining of the leading end and trailing end portions to effect an uninterrupted printing of an indefinite continuous strip of material.

10. A method of continuously screen printing a sheet of material comprising the steps of:
positioning a rotary printing screen having a stencilled portion and an associated squeegee unto the material to be printed in rolling engagement therewith,
printing the material by simultaneously advancing the material in a direction of feed and rotating the printing screen in the printing position thereof relative to said advancing material in predetermined timed relationship,
moving said printing screen and associated squeegee to a non-printing position upon the termination of aprinting operation,
reversing the direction of travel of said material a predetermined amount upon the termination of said printing operation,
and reversing the rotation of said screen an amount corresponding to the reverse movement of said material in the non-printing position thereof,
and including the steps of effecting registration between the screen and material on successive printing operations by rotating the screen in the printing direction,
advancing the material in the direction of feed, and
lowering said rotating screen into contacting relationship with said advancing material thereby the stencilled portion of said screen coincides with a complementary trailing printed portion of the previously printed material, to effect an overprint portion between successive prints.

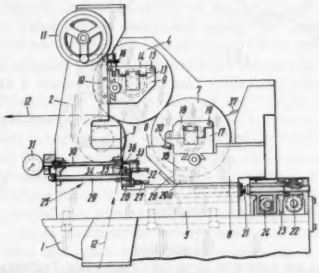
11. A method of continuously screen printing a sheet of material comprising the steps of:
positioning a rotary printing screen having a stencilled portion and an associated squeegee onto the material to be printed in rolling arrangement therewith,
printing the material by a simultaneously advancing the material in a direction of feed and rotating the printing screen in the printing position thereof relative to said advancing material in predetermined timed relationship,
moving said printing screen and associated squeegee to a non-printing position upon the termination of a printing operation,

reversing the direction of travel of said material a predetermined amount upon the termination of said printing operation,
and reversing the rotation of said screen an amount corresponding to the reverse movement of said material in the non-printing position thereof,
and including the step of cushioning the material at the point of contact thereof with said screen to increase the area of contact between the moving material and the screen during a printing operation.

3,889,596
PRINTING UNIT FOR SELECTIVE INDIRECT INTAGLIO AND FLEXOGRAPHIC PRINTING

Hans Robert Thomas, and Wolfgang Eril, both of Weiden, Germany, assignors to Hueck and Cie, Germany

Filed Apr. 30, 1973, Ser. No. 355,683
Claims priority, application Germany, Apr. 29, 1972, 2221188
Int. Cl. B41f *9/00, 13/26, 31/30*
U.S. Cl. 101—154 **15 Claims**

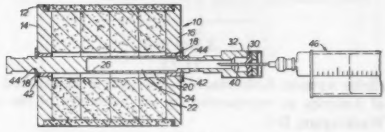


1. Printing unit apparatus operable alternatively for direct intaglio printing and for flexographic printing; said apparatus comprising:
a printing unit frame,
an impression cylinder,
first cylinder supporting means for supporting said impression cylinder for rotation about a first axis of rotation,
first mounting means for mounting said first supporting means on said frame,
a transfer cylinder,
a flexographic plate cylinder,
second cylinder supporting means for selectively and exchangeably supporting one of said transfer cylinder and flexographic plate cylinder for rotation about a second axis of rotation,
second mounting means for mounting said second supporting means on said frame, said second mounting means including vertical adjusting means for adjusting the vertical position of said second axis of rotation at the beginning of each printing operation,
an intaglio plate cylinder,
a fountain cylinder,
third cylinder supporting means for selectively and exchangeably supporting one of said intaglio plate cylinder and said fountain cylinder for rotation about a third axis of rotation disposed in a common horizontal plane passing through the first and third axis of rotation,
third mounting means for mounting said third supporting means on said frame, said third mounting means including horizontal adjusting means for adjusting the horizontal position of said third axis of rotation,
an ink fountain disposed adjacent said third supporting means for supplying ink to one of said intaglio plate and fountain cylinders being supported by said third supporting means,
an oscillating doctor blade means engageable with the one of said intaglio plate and fountain cylinder being supported by said third supporting means,
a patterned surface provided on the intaglio plate cylinder and the fountain cylinder,
said first and third mounting means including means for maintaining said first and third axes of rotation in a common horizontal plane for all adjusted positions of said third axis of rotation,
said impression cylinder and fountain cylinder having the same diameter and said transfer cylinder and intaglio plate cylinder having the same diameter,
whereby flexographic printing operations can be facilitated by placing said flexographic plate cylinder in said second supporting means, by placing said fountain cylinder in said third supporting means, and by appropriately adjusting the position of said second and third axes of rotation with respect to said first axis of rotation,
and whereby indirect intaglio printing operations can be facilitated by placing said transfer cylinder in said second supporting means, by placing said intaglio plate cylinder in said third supporting means, and by appropriately adjusting the position of said second and third axes of rotation with respect to said first axis of rotation.

3,889,597
IMPREGNATED ROLLER

Paul Charlton, Boston, England, assignor to Norprint Limited, England

Filed May 2, 1973, Ser. No. 356,381
Claims priority, application United Kingdom, May 2, 1972, 20331/72; May 19, 1972, 23573/72
Int. Cl. B41f *31/22*
U.S. Cl. 101—367 **6 Claims**



2. In an inking roller an external, porous, generally cylindrical, shell, means defining a plurality of separate, but axially adjacent, ink-absorbent rings the outer peripheries of which are in contact with the inner surface of the shell, hollow shaft means within the rings for delivering ink to the rings, and respective ink distributors disposed between axially adjacent ink-absorbent rings, each ink distributor being arranged to convey ink from the hollow shaft means to a position adjacent the outer periphery of the rings.

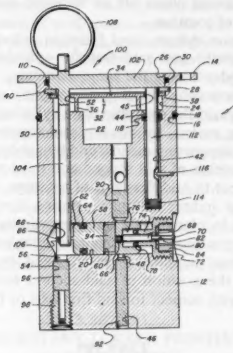
3,889,598
ARMING SYSTEM

Kenneth I. Belsley, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 18, 1968, Ser. No. 740,816
Int. Cl. F42b *22/40*
U.S. Cl. 102—16 **3 Claims**

1. An arming system comprising:
a block member having a first bore therein and a second bore therein, said second bore opening from the exterior surface of said block member and extending into a first extremity of said first bore providing open fluid communication between said first bore and the external environment;
an explosively laden piston member slidably positioned within said first bore in an initial position defining an expansible chamber at said first extremity of said first bore;

pressure increasing means in fluid communication with said expansible chamber operable under conditions defined solely by said second bore in said expansible chamber being filled with a predetermined amount of ambient liquid for moving said piston member from said initial position to a predetermined second position; and



means for restraining said piston member at its position of maximum movement including a retaining ring positioned within said first bore having an aperture therein and a shaft member fixed longitudinally to said piston member having a diameter slightly larger than said aperture,

whereby when said piston member moves to said second position said aperture receives said shaft member providing a frictional fit thereby preventing said piston member from returning to said initial position.

3,889,599

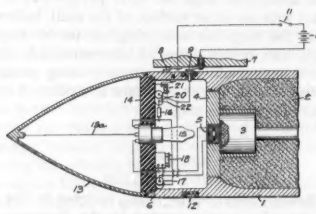
FUZE

Maurice Apstein, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 7, 1951, Ser. No. 209,894

Int. Cl. F42c *13/00*

U.S. Cl. 102—70.2 P **3 Claims**



1. In an explosive missile having an electrostatically charged nose and body members insulated from each other, an electrostatic fuze comprising a thyratron relaxation oscillator, the thyratron switch of said oscillator having grid, anode and cold-cathode members, said grid member connected to said nose, a detonator having a time delay switch normally closed on it in the cathode circuit of said oscillator, a capacitor in the anode circuit of the oscillator, a resistor and a second capacitor in series and shunted across the anode circuit, means for charging the said second capacitor upon firing the missile, said second capacitor discharging to cause the oscillator to initially function for a predetermined period of time, said switch opening at the termination of the initial period of time, said missile upon close proximity to the target causing a positive charge to be impressed upon the grid whereupon said oscillator again oscillates and cathode current passes through the detonator to detonate said missile.

3,889,600

1-(2-(PHENYL-LOWER-ALKYL)-AZIRIDINES MUNITION PAYLOAD

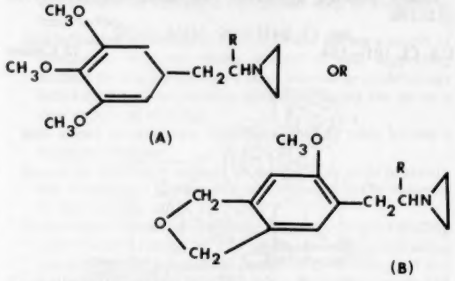
Raj K. Razdan, Belmont, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 22,668, March 25, 1970, Pat. No. 3,637,662, which is a continuation-in-part of Ser. No. 640,815, May 24, 1967. This application Aug. 17, 1971, Ser. No. 172,597

Int. Cl. F42b *11/24*

U.S. Cl. 102—90 **4 Claims**

1. A munition comprising: a means for delivery, and a payload, said payload comprising a compound of the formula



wherein R is hydrogen or methyl.

3,889,601

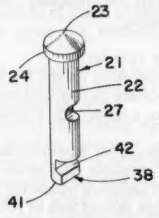
INCENDIARY DEVICE FOR DESTROYING IMPROPERLY HANDLED CLASSIFIED DATA AND THE LIKE

Frank J. Koehne, deceased, late of Wharton, N.J., and by Mildred M. Koehne, administratrix, 6 West Dewey Ave., Wharton, N.J. 07885

Filed Apr. 6, 1965, Ser. No. 446,485

Int. Cl. C06d *1/00*

U.S. Cl. 102—90 **4 Claims**



1. An incendiary device for destroying improperly handled classified data and the like including

a tubular member,

a spring urged clamp pivotally mounted on an upper end of said tubular member,

a container of an incendiary disposed within the upper end portion of said tubular member,

a firing assembly disposed within said tubular member,

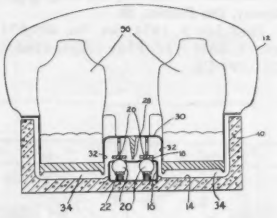
means operatively connected to said firing assembly for actuating said firing assembly when a predetermined tension is applied thereto, and

means within said tubular member for preventing disarming of said firing assembly after said firing assembly has been armed.

3,889,602
METHOD AND APPARATUS FOR TRANSPORTING

Gerald L. Barber, 309 Cardinal Dr., Taylor, S.C. 29687

Filed Mar. 13, 1974, Ser. No. 450,591
Int. Cl. B61b *13/08*
U.S. Cl. 104—23 FS 18 Claims

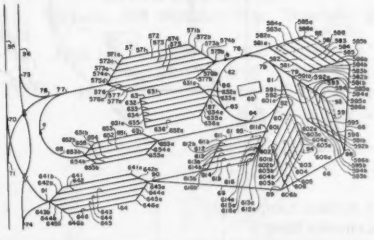


1. In a transporting apparatus; track means, conduit means extending longitudinally along the track means in about the center thereof and adapted to be supplied with air under pressure, valve means distributed along the length of said conduit means in laterally spaced rows and normally closed, a vehicle adapted to run along said track means and to confine therewith a space with which said valves communicate and with a downwardly facing surface of the vehicle closing the top of said space, laterally spaced valve actuating means on the vehicle for opening the valve means of the respective rows which are within the longitudinal range of said space whereby compressed air in said conduit means flows into said space and supplies lifting force to the vehicle, means in said space restricting lateral flow of air therein between said rows of valve means, passage means in the vehicle leading out the rear end thereof from said space whereby compressed air in said space flows through said passage means and supplies rearwardly directed air jet means to exert propulsive force on the vehicle in the forward direction, and means for supplying air under pressure to said conduit means.

3,889,603
DOUBLE LOOP TRACK SYSTEM FOR RAILWAY FREIGHTYARD AND FREIGHT STATION

Minoru Harada, Zushi, Japan, assignor to Japanese National Railways, Tokyo, Japan

Filed Aug. 8, 1974, Ser. No. 496,284
Claims priority, application Japan, Aug. 20, 1974, 49-92426
Int. Cl. B61b *1/00*
U.S. Cl. 104—26 R 8 Claims

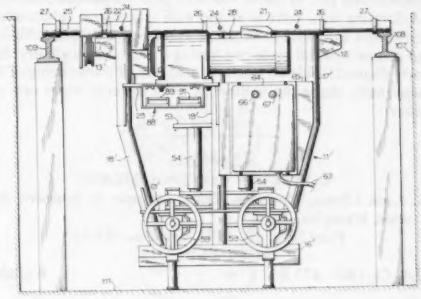


1. A loop track system for a railway freightyard and freight station, comprising an arrival line connected to main lines to receive arriving trains, a departure line connected to said main lines to allow departure of made up trains, at least one divergent loop track connected to the arrival line and a convergent loop track connected to the departure line, a plurality of sorting lines connected to said divergent loop track each having a plurality of parallel connected sidings therein and extending in a diverging direction therefrom, the ends of said sorting lines in the direction of movement of railway cars through said system being coupled to said convergent loop track, whereby when railway cars received on the arrival lines are pushed toward said divergent loop track, said cars can be switched along said divergent loop track and sorted onto appropriate sidings of said sorting lines and then connected successively in the desired order in a train along said convergent loop track to the departure line.

3,889,604
DRAFT GEAR HANDLING CARRIAGE

Glendon R. Lollis, 10405 Mockingbird Dr., and Leroy C. Lucke, 10878 Iowa Plaza, both of Omaha, Nebr. 68127

Filed Aug. 26, 1974, Ser. No. 500,302
Int. Cl. B60s *13/00*
U.S. Cl. 104—32 R 7 Claims



1. A draft gear handling carriage adapted to be used in a railroad maintenance pit and to be carried by the pit rails which support railway rolling stock during servicing, the carriage comprising

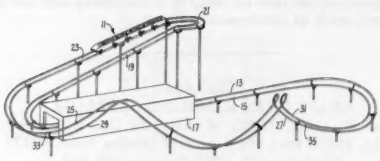
a. a framework,
b. means, including a pair of parallel axles carried by bearings fixed to upper portions of the framework, for supporting the carriage on the pit rails and for providing driving traction therebetween;
c. a reversible electric propulsion motor carried by the framework;
d. a drive train interconnecting the propulsion motor and the axles for transmitting driving torque to the latter;
e. an electrically operated scissors lift located within the framework and supported by a lower portion thereof, the lift having a table movable between a retracted position near the bottom of the framework and a raised position in the region of the elevation of the axles;
f. a jack pad supported and guided on the table for sliding movement in a horizontal plane;
g. a manually operated jack assembly mounted on the pad and serving to raise and lower a platform which carries draft gears; and
h. an electrical power distributor mounted on the framework and including a single inlet through which power is applied to the carriage, a reversing circuit for the propulsion motor, and power outlets connected, respectively, with the propulsion motor and the scissors lift.

3,889,605

AMUSEMENT RIDE WITH A VEHICLE TRACK PORTION FOLLOWING THE SHAPE OF A HELIX

Karl W. Bacon, Mountain View, Calif., assignor to Arrow Development Co., Inc., Mountain View, Calif.

Filed Feb. 19, 1974, Ser. No. 443,814
Int. Cl. A63g 21/10
U.S. Cl. 104—56 12 Claims



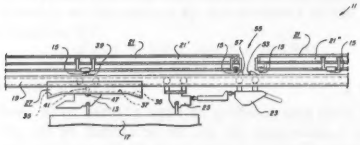
1. An amusement ride including a passenger carrying vehicle and means including a pair of tracks fixed with respect to the ground for carrying and guiding said vehicle over a predetermined path, said tracks comprising a portion wherein each track of said pair of tracks follows a path in space substantially conforming to a helix in shape with a common substantially horizontal axis, said helix shape extending a length sufficient for at least one full cycle and having a pitch that is greater than forty degrees, said two tracks of said pair of tracks being of the same helix shape but shifted an axial distance from one another.

3,889,606

CONVEYOR CONTROL MEANS

A. Leon Linton, Memphis, Tenn., assignor to Southern Systems, Memphis, Tenn.

Filed Mar. 18, 1974, Ser. No. 452,433
Int. Cl. B61b 13/00
U.S. Cl. 104—172 S 8 Claims



1. Control means for use with a typical conveyor system which includes a trolley member selectively driven by a pusher member to move a load from one location to another, said control means comprising:

a. cam means for fixedly mounting to the conveyor system in proximity with the trolley member, said cam means including first and second cam members for mounting to the conveyor system with one on either side of and in proximity with the trolley member; and

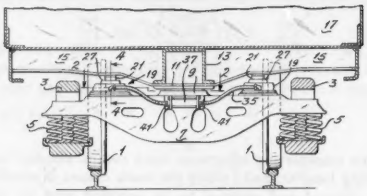
b. dog means for movably mounting in the trolley member, said dog means including a pin member for vertical movement between a first position out of the path of the pusher member to allow the pusher member to move without moving the trolley member and a second position in the path of the pusher member to allow the pusher member to drive the trolley member, said dog means including cam follower means mounted to said pin member for coacting with said cam means to cause said pin member to move between the first and second positions, said cam follower means of said dog means including first and second cam follower members mounted one on either side of said pin member, said first and second cam members and said first and second cam follower members coacting together to cause a stable and uniform movement of said pin member between the first and second positions.

3,889,607

CAR ROCK AND ROLL HYDRAULIC SIDE BEARING STABILIZING ARRANGEMENT

Robert L. Hassenauer, Wilmette, Ill., assignor to Evans Products Company, Des Plaines, Ill.

Filed July 5, 1974, Ser. No. 485,971
Int. Cl. B61f 5/14; F16c 17/04; F16f 9/10
U.S. Cl. 105—199 CB 10 Claims



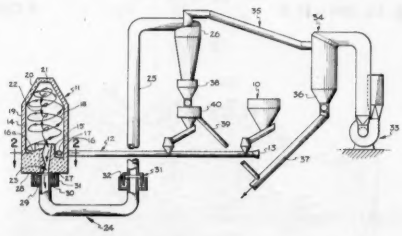
1. A railway car side bearing system for placement between a car truck part and a car body part comprising a pair of transversely spaced bearing devices each having a sealed fluid-filled chamber with relatively vertically movable top and bottom portions, conduit means connecting said sealed chambers with each other and includinga normally closed valve device openable under rock and roll including a and responsive to fluid pressure to the compressed side bearing chamber in excess of a predetermined pressure to provide restricted passage of fluid from the compressed side bearing chamber to the other chamber.

3,889,608

APPARATUS FOR THE PREPARATION OF SILICEOUS ASHES

Norman Pitt, Los Angeles, Calif., assignor to Structural Materials, Los Angeles, Calif.

Continuation-in-part of Ser. No. 276,134, July 28, 1972, abandoned, and a continuation-in-part of Ser. No. 407,907, Oct. 19, 1973. This application Mar. 18, 1974, Ser. No. 452,003
Int. Cl. F23g 7/00
U.S. Cl. 110—8 R 6 Claims



1. A furnace comprising:

a. a circular base;

b. cylindrical side walls projecting upwardly from said base;

c. a top portion covering said side walls;

d. a peripheral tangential material inlet to said furnace at the bottom portion thereof for admitting material to be burned, and;

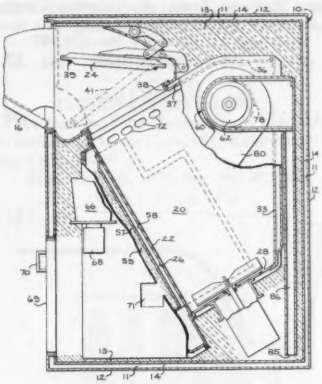
e. outlet means in said base for discharging burned material, said outlet means comprising a hollow cylinder projecting concentrically into said furnace above said base.

3,889,609

AIR-COOLED ELECTRIC TERMINALS FOR AN INCINERATOR

Christian A. Eff, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Apr. 12, 1974, Ser. No. 460,373
Int. Cl. F23g 5/10
U.S. Cl. 110—8 E 2 Claims



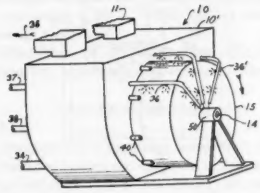
1. In an incinerator having a combustion chamber; a heater compartment external said combustion chamber; electrical heating means disposed in said heater compartment for causing incineration of combustibles deposited within said combustion chamber; an electric terminal extending from said heater compartment for connecting said electrical heating means to an electrical source external said incinerator for powering said heating means, said terminal further comprising an elongated clamp extending from said heater compartment to an outer portion of said incinerator, a ceramic insulator disposed within said elongated clamp, and a lead-in member disposed within said ceramic insulator; and a passageway intermediate said combustion chamber and said heater compartment for the passage of air, the improvement comprising: ducting means connecting said heater compartment and said passageway, said ducting means being disposed adjacent said clamp and ceramic insulator of said terminal to direct air flowing from said passageway against said lead-in member and into said heater compartment.

3,889,610

COMPACT ROTARY-HOUSING INCINERATOR AND STEAM GENERATOR

Cecil E. Williams, 274 Opihikao Way, Honolulu, Hawaii 96825

Filed July 20, 1973, Ser. No. 381,262
Int. Cl. F23g 5/06
U.S. Cl. 110—10 7 Claims



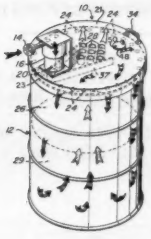
1. Incinerator apparatus comprising a rotary cylindrical drum forming a combustion chamber, said drum having one open axial end and a closed second axial end, support means connected to the drum for rotatably supporting said drum, said support means including an axial bearing at the closed end, rotating means connected to the drum for rotating the drum, stationary housing means surrounding the open end of the drum, combusting means positioned within the drum for supporting combustible materials within the drum, feed means positioned within the drum for feeding combustible materials to the combusting means, air input means positioned within the drum for supplying air to combustible materials on the combusting means, ash removal means positioned within the drum for receiving ash from the combusting means and removing ash from the drum, and contilever means mounted in the housing and extending through the open end of the drum into the drum for supporting the feed means, combusting means, air input means and ash removal means within the drum, and gas withdrawal means connected to the housing for withdrawing combustion gas from the drum through the open end and from the housing.

3,889,611

TRASH BURNER CONVERSION UNIT

Herman S. Starbuck, 7720 Spirea Dr., Cincinnati, Ohio 45236

Filed Apr. 23, 1973, Ser. No. 353,338
Int. Cl. F23g 5/00
U.S. Cl. 110—18 R 13 Claims



1. A manually portable lid-like device for association with the open top of a container for producing a combustion-supporting environment within the interior of said container, said device comprising a closed chamber having upper, lower and side walls, said chamber including an air inlet port and means secured to and carried by the upper wall thereof for introducing air under pressure into said air inlet port, said lower wall having a plurality of air exhaust ports therethrough wherein said exhaust ports are spaced about and disposed adjacent the periphery of said lower wall, and means for retaining said device over and in closing relationship with the open top of a container.

3,889,612

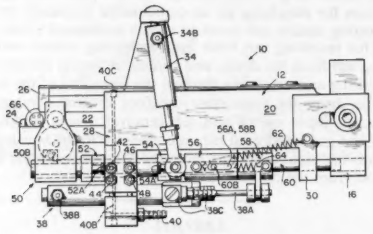
BUTTON DELIVERING APPARATUS

Francis H. Hughes, North Troy, and Douglas J. Crawford, Troy, both of N.Y., assignors to Cluett, Peabody & Co., Inc., New York, N.Y.

Filed Dec. 7, 1973, Ser. No. 422,707
Int. Cl. D05b 3/22
U.S. Cl. 112—113 11 Claims

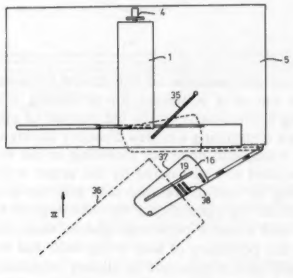
1. In a button delivering means of the type including a button clamp, a button delivery head for engaging and advancing buttons one at a time to the clamp, first actuator means for advancing and retracting said delivery head, and second actuator means for rocking said head for engaging and releasing buttons, the improvement characterized by a fluidic control system for said button delivery means which comprises

a. a plurality of pressure responsive fluidic control devices for controlling said actuator means,
b. a plurality of air-discharging control ports, one associated with each of said fluidic control devices,
c. means to supply air under pressure to said control ports for discharge therefrom,



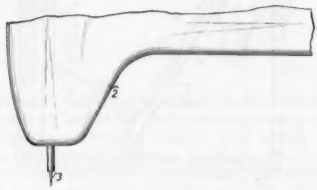
d. means responsive to predetermined motions of said delivery head to effect relative opening and closing of said air-discharging ports to vary the condition of said fluidic devices, and
e. means interconnecting said fluidic control devices and said actuators, whereby to cause sequential, programmed operation of said actuators in response to sequential relative closings and openings of said ports.

3,889,613
METHODS OF STITCHING A SEAM
Petrus Cornelius Gerardus Hofland, Jules Verneweg 22, Tilburg, Netherlands
Filed Sept. 24, 1973, Ser. No. 400,209
Int. Cl.[2] D05B *35/10*
U.S. Cl. 112—121.15 **16 Claims**



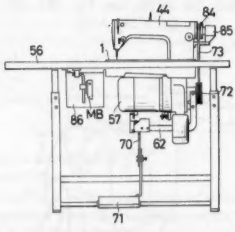
2. An apparatus for use with a sewing machine for stitching a seam in a folded-over piece of cloth comprising:
an arm,
means pivotally coupling one end of said arm to the sewing machine;
having a folding edge a plate for folding a piece of cloth;
means adjustably fastening said plate to the other end of said arm with said folding edge facing the sewing machine whereby said plate is pivotally coupled to the sewing machine for swinging toward or away from the sewing machine;
holding means engageable with said plate for holding the piece of cloth folded over said plate means;
means movably coupling said holding means to the sewing machine, whereby said holding means is movable along a predetermined path on a table top of the sewing machine;
means for withdrawing said plate by swinging said plate away from the sewing machine from the piece of cloth; and
means for moving said holding means beneath a sewing needle of the sewing machine.

3,889,614
FEED FOR SEWING MACHINE
Karl Nicolay, Bielefeld; Karl Buschmann, Brackwede, and Jesus Perez Madueno, Brake, all of Germany, assignors to Durkoppwerke GmbH, Bielefeld, Germany
Filed Aug. 22, 1974, Ser. No. 499,407
Claims priority, application Germany, Aug. 22, 1973, 2342305
Int. Cl.[2] D05B *35/10*
U.S. Cl. 112—153 **10 Claims**



1. A workpiece feed for a sewing machine having a pair of laterally open guides provided on a stitching surface adjacent a stitching location thereon and having a pair of guide edges offset from the stitching location and parallel to the machine stitching direction, said feed comprising:
a pair of rollers to either side of the stitching surface downstream from said stitching location and each rotatable in a roller plane intercepting said guide edges downstream of said rollers; and
a pair of axles defining respective rotation axes transverse to said direction supporting said rollers.

3,889,615
SAFETY DEVICE FOR A SEWING MACHINE
Seizo Uozake, Toyota, and Hitoshi Sakashita, Nukata, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan
Filed May 30, 1974, Ser. No. 474,620
Claims priority, application Japan, May 30, 1973, 48-61383
Int. Cl. D05b *65/00*
U.S. Cl. 112—252 **6 Claims**



1. A safety device for use in conjunction with the thread cutting mechanism of a sewing machine, comprising:
a main power source for actuating a main drive shaft of said machine for the performance of a stitching operation;

connecting means operable for connecting said main power source with said main drive shaft;

sensing means sensitive to the rotational condition of said main drive shaft and capable of generating a signal in response thereto;

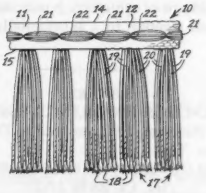
a thread cutting device operable for holding and cutting the thread of said machine in response to said generated signal of said sensing means; and

detent means operatively connected to said connecting means for preventing the connection of said power source to said drive shaft during a thread cutting operation.

3,889,616
TUFTED FRINGE PRODUCT

William Erby Passons, 1805 Verona Ave., Chattanooga, Tenn. 37421, and Joseph Lewis Card, 1515 Edgewater Cir., Chattanooga, Tenn. 37406

Filed Mar. 18, 1974, Ser. No. 452,288
Int. Cl.² B32B *7/08*
U.S. Cl. 112—409 **6 Claims**



1. A fringe product comprising:

a. an elongated, flexible, pre-formed tape member having substantially flat face and back surfaces on opposite sides of said tape member,

b. a plurality of longitudinally spaced, alternating first and second fringe tufts projecting from the back surface of said tape member,

c. each of said fringe tufts comprising at least one first strand and at least one second strand extending through the thickness of said tape member,

d. a first back stitch extending longitudinally over said face surface and integrally joining said first strands in adjacent fringe tufts,

e. a second back stitch extending longitudinally over said face surface and integrally joining said second strands in adjacent fringe tufts, and

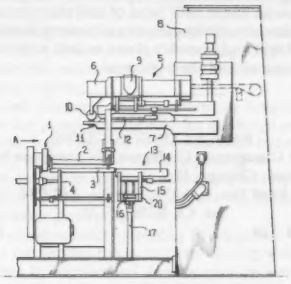
f. said first and second back stitches alternating in longitudinal alignment.

3,889,617
APPARATUS FOR FORMING TUBULAR BODIES HAVING LONGITUDINAL SIDE SEAMS

Uwe J. Lorenzen, and Harald Martens, both of Wedel, Germany, assignors to Schmalbach-Lubeca GmbH, Braunschweig, Germany

Filed Mar. 18, 1974, Ser. No. 452,046
Claims priority, application Germany, Mar. 23, 1973, 2314553
Int. Cl. B21d *51/26*
U.S. Cl. 113—8 **12 Claims**

1. In an apparatus for handling unseamed tubular bodies wherein the tubular bodies are supplied in unseamed form and the apparatus includes a guide rail having grooves therein for receiving unseamed edges of the tubular bodies, a transfer mechanism including support means for receiving unseamed tubular bodies, expanding means for expanding an unseamed tubular body seated on said support means to move unseamed edges thereof into spaced relation, and feed means for feeding an expanded unseamed tubular body towards said guide rail to

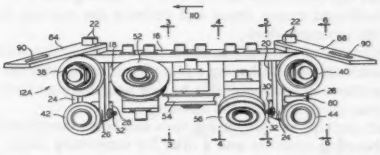


a position adjacent said guide rail wherein unseamed edges of a tubular body will engage in the grooves of said guide rail.

3,889,618
ROLLING APPARATUS

Lactance A. Jarvis, Buchanan, and Ronald L. Nimtz, Berrien Springs, both of Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Filed June 26, 1974, Ser. No. 483,263
Int. Cl. B21d *39/02*
U.S. Cl. 113—55 **10 Claims**



1. An apparatus for simultaneously rolling and securing, in a longitudinal direction, the transversely extending edges of an elongate sheet material along and around the underlying outer edges of opposed parallel frame members, said apparatus including first and second transversely and rigidly interconnected allochiral tool assemblies, wherein each of said assemblies comprises:

a. a carriage assembly movable along the surface of said sheet material at the outer edge of one of said frame members;

b. longitudinally spaced and vertically disposed first and second upper guide rolls, carried by said carriage assembly, for rotatably contacting a first surface of said sheet material;

c. a vertically disposed first lower guide roll carried by said carriage assembly and vertically aligned with said first upper guide roll, for rotatably contacting a lower surface of said frame member outer edge;

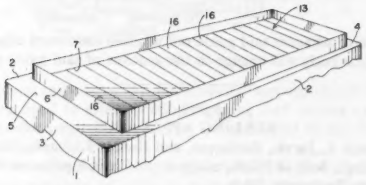
d. a vertically disposed second lower guide roll, carried by said carriage assembly and vertically aligned with said second upper guide roll, for rotatably contacting a second surface of said sheet material;

e. a plurality of form rolls carried by said carriage assembly, longitudinally in tandem, between said first and second upper and lower guide rolls, respectively, for progressively bending the transversely extending edge of said elongate sheet material along and substantially complete around the underlying outer edge of said one frame member; and

f. a horizontally disposed edge roller, carried by said carriage assembly between, but transversely spaced from, said vertically disposed second upper and lower guide rolls, said edge roller contacting the generally vertically

outer edge of said sheet material after it is bent around said frame outer edge by said form rolls, said edge roller coacting with said second upper and lower guide rolls to complete an about 180° bend of said sheet material, said edge roller also minimizing any undesired skewing movement of said tool assembly about an axis perpendicular to the surface of said sheet material.

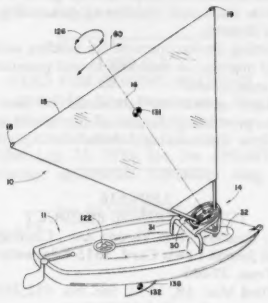
3,889,619
BARGE CONSTRUCTION
John Joseph Glassmeyer, Covington, Ky., assignor to Pullman Incorporated, Chicago, Ill.
Filed Feb. 6, 1974, Ser. No. 440,094
Int. Cl. B63b *35/28*
U.S. Cl. 114—26 **12 Claims**



1. In a barge construction a cargo hold arrangement including:
a flat top outer deck having a cargo opening and a vertical bulkhead means about and defining the opening below the top outer deck,
a plurality of vertically stacked cargo decks in the opening, each cargo deck having a plurality of removable decking sections in horizontal side by side neighboring relation to one another within the opening,
each decking section having ends and being comprised of a beaming structure and a floor for supporting cargo,
a plurality of bracket means for supporting each of the decking sections within the opening, each one of said bracket means including a vertical wall having a pair of hook means and a horizontal wall supporting the end of the decking section of a cargo deck adjacent the bulkhead means,
said bulkhead means having a plurality of pairs of apertures spaced horizontally along said bulkhead means at each level of said cargo deck, and
each one of the pairs of apertures being disposed for removably receiving the pair of hook means of a bracket means so that said bulkhead means carries the bracket means and the horizontal wall of the bracket means supports the end of the decking section of a cargo deck.

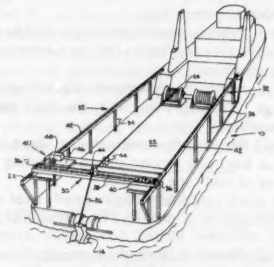
3,889,620
SYMMETRICAL SAIL ASSEMBLY
Charles Kenneth Dorland, 525 Fairway Dr., Broken Arrow, Okla. 74012
Filed Feb. 1, 1974, Ser. No. 438,876
Int. Cl. B63h *9/08*
U.S. Cl. 114—39 **4 Claims**

1. In combination with a wind propelled vehicle, an assembly for carrying a sail above said wind-propelled vehicle comprising:
a turntable mounted on said vehicle,
means for rotating said turntable relative to said vehicle around an axis of symmetry passing through said turntable,
a pair of booms for carrying a sail therebetween pivotally mounted at their lower ends to said turntable and extending divergently upwardly from said turntable and defining a plane with said axis of symmetry, said booms extending symmetrically upwardly with respect to said axis of symmetry,



and means for tilting said turntable with respect to said vehicle about a substantially horizontal transverse axis whereby said axis of symmetry is movable from a substantially vertical position to a substantially horizontal position.

3,889,621
ANCHOR HANDLING VESSEL
Floyd T. Pease, Houston, Tex., assignor to The Offshore Company, Houston, Tex.
Filed Oct. 25, 1973, Ser. No. 409,395
Int. Cl. B63b *21/22*
U.S. Cl. 114—206 R **7 Claims**



1. An anchor handling apparatus comprising:
a buoyant vessel having a deck for receiving an anchor,
a pair of tracks disposed adjacent opposed sides of said deck and extending longitudinally of said deck,
an elevated transverse bridge structure extending between said tracks and movable longitudinally of said deck along said tracks,
a powered winch on said vessel for reeling in a line connectible to said anchor and extending generally longitudinally of said deck, and
anti-friction support means on said bridge structure intermediate said tracks for supporting said line extending generally longitudinally of said deck from said winch over said support means to said anchor,
said tracks being spaced from each other by a distance greater than the width of the anchor to be handled, so that said anchor may freely pass between said tracks, and the space between said tracks and above said deck being free of obstructions which would interfere with the movement of said anchor, whereby said anchor may be freely moved longitudinally of said deck between said tracks by said bridge structure and deposited at a desired location on said deck intermediate said tracks.

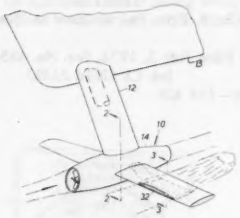
said tracks being essentially straight throughout their effective length and including a portion which is cantilevered beyond the edge of said deck during the operation of said bridge structure whereby said bridge structure may be selectively positioned outboard of said vessel.

3,889,622

MARINE PROPULSION

John Lanfear Scott-Scott, Bulkington, England, assignor to Rolls-Royce (1971) Limited, London SW1Y 4JR, England

Continuation-in-part of Ser. No. 329,342, Feb. 5, 1973, abandoned. This application Sept. 18, 1974, Ser. No. 507,193
Claims priority, application United Kingdom, Feb. 11, 1972, 6474/72
Int. Cl. B63h *5/00*
U.S. Cl. 115—11 **5 Claims**



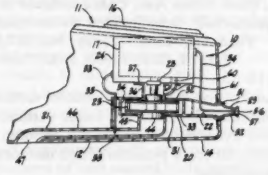
1. A marine propulsion unit comprising a duct and a centerbody located within the duct, the centerbody having located within it combustion means arranged to receive fuel and compressed air from a source located remotely of the centerbody and turbine means arranged to drive an impeller located in the inlet of the duct, at least one wing-like arm extending laterally of the duct being provided, the said arm having a span-wise nozzle which extends over the whole chord of said arms, water being capable of flowing through said nozzle, the exhaust from the turbine means being arranged to flow through said arm to be mixed with water flowing through said nozzle over substantially the whole of the span-wise width of the said nozzle.

3,889,623

JET PROPULSION UNIT FOR BOATS

Robert W. Arnold, 819 Merriwether St., Cape Girardeau, Mo. 63701

Filed Jan. 31, 1974, Ser. No. 438,295
Int. Cl. B63h *11/04*
U.S. Cl. 115—16 **2 Claims**



1. In combination with a boat, a jet propulsion unit comprising:

a. a boat hull including forward and rearward ends and having an intake opening intermediate said ends and a discharge opening at the rearward end disposed below the water line,

b. a drive motor,

c. a centrifugal pump mounted between said intake and discharge openings and including:

1. an impeller having a drive shaft, said shaft defining a substantially vertical axis of rotation and being connected to the motor in drive relation, and a coaxial inlet opening, and

2. a housing receiving the impeller in rotatable relation,

d. a first intake passage extending longitudinally between the intake opening and the inlet opening of the pump impeller,

e. a second discharge passage extending longitudinally between the pump housing and the discharge opening,

f. a venturi unit mounted in the discharge passage, and

g. cooling means for the motor including:

1. a water jacket disposed about said motor,

2. a first conduit extending between the first passage and the water jacket, and

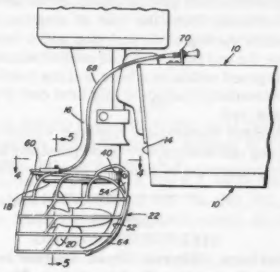
3. a second conduit extending between the water jacket and the venturi throat to draw cooling water from the jacket by suction and thereby pick up water from the first passage through the first conduit for circulation through said jacket.

3,889,624

RETRACTABLE PROPELLER GUARD FOR OUTBOARD MOTOR OR STERN DRIVE UNIT

Donald G. Balius, 1003 Caillavet St., Biloxi, Miss. 39530

Filed June 13, 1974, Ser. No. 479,257
Int. Cl. B63h *5/16*
U.S. Cl. 115—42 **9 Claims**

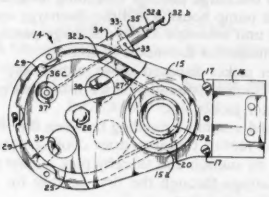


1. A mounting bracket including means for support from the lower portion of the upstanding power leg of an outdrive marine propulsion unit of the type including a horizontal cavitation plate spaced above a marine propeller journaled from the power leg lower portion, said bracket including front and rear portions, a rod cage constructed of contoured, crossed and interconnected rod members, said cage including opposite upstanding side portions and a rear portion extending between and interconnecting the rear ends of said side portions, means pivotally supporting upper forward end portions of said side portions from the front portion of said bracket for oscillation of said cage about a horizontal transverse axis, said cage opening forwardly between the forward ends of said side portions as well as upwardly and downwardly and being swingable relative to said bracket between an operative generally horizontally disposed position opening forwardly in a horizontal direction and an inoperative rearwardly and upwardly tilted position with said cage opening forwardly in a forwardly and downwardly inclined direction.

3,889,625
CONTROL CABLE CONNECTION FOR AN ELECTRIC TROLLING MOTOR

William G. Roller, Purdy, Mo., and Emery L. West, Oklahoma City, Okla., assignors to William G. Roller, Purdy, Mo.

Filed Oct. 1, 1973, Ser. No. 402,289
Int. Cl. B63h *21/26*
U.S. Cl. 115—18 E 4 Claims



1. In a remote control unit for directionally controlling an electric trolling motor having an elongate shaft with a water submergible propulsion unit on the lower end thereof, the combination comprising:

a housing equipped with a rotatable sleeve which receives and fixedly retains the elongate shaft of the trolling motor to correspondingly rotate said shaft with said sleeve;

a wheel member pivotally mounted within said housing and being larger in diameter than said sleeve;

linkage means interconnecting said wheel member and said sleeve to impart rotational movement of said wheel member to said sleeve;

a retractable and extendable control wire partially disposed within said housing and having a bent end to form substantially an L-shaped portion on the end of said wire;

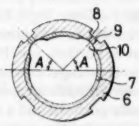
a post-like connector pivotally installed on said wheel member outwardly from the axis of rotation thereof, said connector having a vertical slot and a bore therein to receive the end portion of said control wire with said bent end disposed within said bore and the portion of control wire immediately adjacent said bent end disposed within said slot; and

a pin member transversely disposed within said slot and overlying said control wire to permanently but removably secure connection of said wire to said connector.

3,889,626
STERN TUBE BEARING

Minoru Kakihara, Okayama, Japan, assignor to Mitsui Shipbuilding & Engineering Co. Ltd., Tokyo, Japan

Filed May 8, 1973, Ser. No. 358,461
Claims priority, application Japan, May 16, 1972, 47-56873; May 17, 1972, 47-58356
Int. Cl. F16c *1/24, 3/14, 33/00, 33/66*
U.S. Cl. 115—34 R 2 Claims



1. A stern tube bearing assembly comprising a propeller shaft subject to a lateral force in a horizontal plane at a contact position, and a bearing metal having an inside cylindrical surface positioned within the stern tube and surrounding said propeller shaft to support the same, said lateral force operable to effect relative displacement of said shaft in said bearing metal surface toward and away from said contact position, said propeller shaft having a continuous cylindrical surface coaxial with the inside cylindrical surface of the bearing metal and said bearing axis, said inside cylindrical surface being continuous and uninterrupted within and below the horizontal plane of the bearing axis, and being continuously cylindrical but interrupted by at least one oil groove extending axially on the inside cylindrical surface of the bearing metal in a position above the horizontal plane of the bearing axis, oil passage means extending axially in the outer periphery of the bearing opposite said groove, means to supply bearing oil to said passage means, and oil supply aperture means communicating said oil groove with said oil passage, said groove and said oil supply aperture means being separated from said contact position to avoid breaking of the oil film at said position and to provide a continuous uninterrupted film of oil on the portion of said inside surface which supports said propeller shaft.

3,889,627
TILT INDICATOR FOR SHIPPING CONTAINERS AND THE LIKE

Harold S. Cloyd, Erie, Pa., assignor to Nosco Plastics, Inc., Erie, Pa.

Filed July 3, 1974, Ser. No. 485,368
Int. Cl. G01d *21/00*
U.S. Cl. 116—114 AH 8 Claims

1. An indicator for providing a positive indication that an object has been tilted comprising a body for attachment in a vertical plane in fixed relation to said object, a pendulum pivoted on said body for rotation in said plane, a unidirectional means for said pendulum permitting rotation of said pendulum in a single direction and preventing reverse rotation of said pendulum whereby said pendulum indicates the maximum tilt of said object in said plane and the direction it is permitted to rotate, and stop means for said pendulum limiting its rotation to substantially one half revolution.

3,889,628
FLUID MATERIAL APPLICATOR

Martin A. Usab, Santa Ana, Calif., assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Aug. 13, 1973, Ser. No. 387,645
Int. Cl. B05c *11/00, 5/00, 7/00*
U.S. Cl. 118—3 17 Claims

1. Apparatus for coating the outside surface of a pipe or other cylindrical object or the inside surface of a fitting or other hollow cylindrical object with a predetermined quantity of fluid material for a predetermined distance from the end thereof comprising:

a first body section having a first, enclosed chamber therein for containment and storage of said fluid material and a second, open-ended chamber at one end thereof;

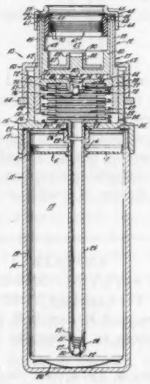
means in said first body section forming a first passageway interconnecting said first and second chambers to permit fluid communication therebetween;

first one-way valve means positioned in said first passageway between said first and second chambers for permitting passage of said fluid material only from said first chamber to said second chamber;

a second body section connected to and moveable relative to said first body section, said second body section having a third, open-ended chamber at one end thereof positioned facing said second open-ended chamber in said first body section, said second and third open-ended chambers cooperating to define an enclosed, compressible, metering chamber in selective fluid communication with said first chamber via said first passageway, said second body section further including means defining an annular area adapted to surround the end of a pipe or lie within the end of a fitting;

means in said second body section forming a second passageway interconnecting said metering chamber and said annular area to permit fluid communication therebetween;

said one-way valve means positioned in said second passageway between said metering chamber and said annular area for permitting passage of said fluid material only from said metering chamber to said annular area, said end of said pipe or said end of said fitting being adapted to engage said second body section and to move said second



body section toward said first body section by a predetermined maximum amount, movement of said second body section toward said first body section by said predetermined amount compressing said metering chamber and pumping said predetermined quantity of fluid material through said second passageway, past said second one-way valve means, to said annular area;

means positioned between said first and second body sections for urging said second body section away from said first body section whereby movement of said pipe or fitting out of engagement with said second body section causes movement of said second body section away from said first body section, expanding said metering chamber, and pumping said fluid material from said first chamber, through said first passageway, past said first one-way valve means, into said metering chamber to refill same; and

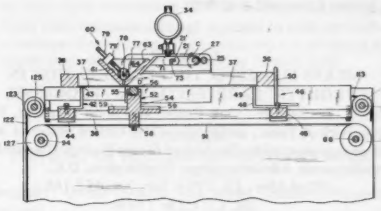
means in said second body section responsive to movement of said pipe or fitting out of engagement with said second body section for uniformly distributing said pumped predetermined quantity of fluid material across said outside surface of said pipe or said inside surface of said fitting.

3,889,629

STENCIL SCREEN COATING MACHINE

James A. Black, 13700 Sparta Ave., Kent City, Mich. 49330

Filed Mar. 16, 1973, Ser. No. 342,168
Int. Cl. B05c *11/04*
U.S. Cl. 118—6 **13 Claims**



1. A machine for applying a fluid coating to the surface of planar stock comprising:

a base including side walls;

means on said base for supporting planar stock to be coated;

carriage means extending between said side walls above said support means and movable in a direction generally parallel to the plane of stock supported on said support means;

coating means detachably coupled to said carriage means for easy removal and including an adjustable pivotable coating tray for receiving a coating fluid and dispensing a coating of said fluid of predetermined thickness to the planar stock as a function of the pivot adjustment of said tray as said coating means traverses the stock in response to the movement of said carriage means; and

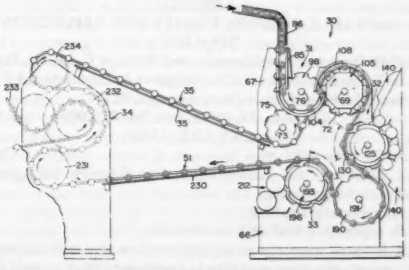
drive means coupled to said carriage means for sliding said carriage means to transport said coating means across at least a portion of the planar stock.

3,889,630

HIGH SPEED CAN PRINTING MACHINE

Wesley J. Szpitalak, Palos Park, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Division of Ser. No. 242,110, April 7, 1972, Pat. No. 3,786,747, which is a division of Ser. No. 501,372, Oct. 22, 1965, Pat. No. 3,683,799. This application Sept. 24, 1973, Ser. No. 399,828
Int. Cl. B05c *11/00*
U.S. Cl. 118—46 **6 Claims**



1. A can body printing machine comprising an endless continuously moving conveyor chain having separately rotatable evenly spaced can body receiving mandrels projecting from one side thereof, a plurality of sprockets supporting said chain for movement about a twisting endless path, means for automatically placing can bodies on said mandrels, a printing apparatus positioned adjacent the path of said mandrels for

printing on the exteriors of can bodies while carried by said mandrels as the can bodies pass said printing apparatus in a first rotational direction, a varnishing apparatus positioned adjacent the path of said mandrels for applying a coating of varnish over printing on can bodies as the printed can bodies pass said varnishing apparatus in a second rotational direction, and means for automatically removing printed and varnished can bodies from said mandrels.

3,889,631

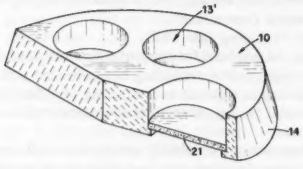
MEANS FOR EFFECTING FLUIDIZATION IN PYROLYTIC CARBON COATING PROCESSES

Walter J. Lackey, Jr., Oak Ridge, and John D. Sease, Knoxville, both of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 18, 1974, Ser. No. 452,166

Int. Cl. C23c *13/08*

U.S. Cl. 118—48 **1 Claim**



1. A fluidized bed coater comprising:
a coating chamber and heating means therewith;
a porous plate defining the chamber bottom wall and the upper wall of a plenum chamber;
means feeding and distributing a fluidizing gaseous stream into said plenum chamber, said gas then passing through said porous plate to effect fluidization of particulate material supported on said plate;
said porous plate being relatively thick, whereby to adequately support the particulate material in a quiessent state, and having a plurality of uniformly spaced apertures therein;
a relatively thin replaceable porous plate supported in each said aperture; and
said thin plate of a dimension whereby the passageways thereof will not clog due to decomposition products of said gaseous stream.

3,889,632

VARIABLE INCIDENCE DRIVE FOR DEPOSITION TOOLING

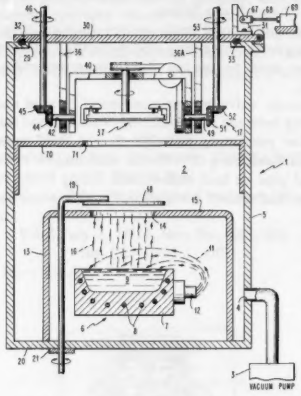
Rolf H. Brunner, Poughkeepsie, and William C. Lester, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 31, 1974, Ser. No. 475,005

Int. Cl. C23c *13/08*

U.S. Cl. 118—49.1 **1 Claim**

1. Apparatus for coating a plurality of substantially planar substrates comprising
A. a coating chamber;
B. a port in a wall of said chamber;
C. a hatch means pivotally mounted on said wall for movement into open and closed position relative to said port with said closed position securing said hatch in sealing relationship with said coating chamber; oscillatory frame means supported on the inner wall of said hatch means;
E. means supporting said frame additionally supporting means to oscillate said frame;
F. rotatable means supported within the said frame and mounting a plurality of substrate holders in a substantially common plane on a circle concentric with the axis of said rotatable means;
G. means rotating said rotatable means whereby to orbit said holders about said axis, said axis being normal to the axis of said oscillation;
H. rotary means carried on said rotatable means and operatively associated with said holders whereby to rotate each said holder about its own axis which is normal to the axis of said oscillation;



I. drive means common to each said rotary and rotatable means whereby to simultaneously effect said holder orbital and rotative movements;
J. said holder orbital and rotative and said frame oscillatory movements occurring simultaneously; and
K. coating means comprising a vapor source for evaporating and directing a stream of coating material onto said substrates.

3,889,633

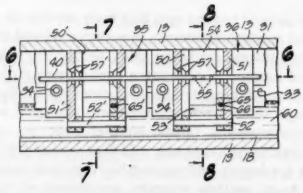
APPARATUS FOR APPLYING ONE OR MORE STRIPES TO CONDUCTORS

Glenn F. Roquemore, and Roderick B. Lacy, both of Escondido, Calif., assignors to Formulabs Industrial Inks, Inc., Escondido, Calif.

Filed May 8, 1974, Ser. No. 467,890

Int. Cl. B05c *1/06, 1/16*

U.S. Cl. 118—68 **19 Claims**



1. Apparatus for applying a coding stripe to a conductor comprising: a stripe applicator station located between conductor supply means and conductor takeup reel means, said applicator station including coding ink supply means, capillary ink feeding means in communication with said ink supply means and extending to a position of contact with a conductor while being moved therepast and onto said takeup reel means, impervious mask means positioned between the surface of the conductor and said ink feeding means, said mask means having an opening the width of which does not exceed the desired width of the stripe being applied to said conductor and into

which opening said ink feeding means projects, and means for holding the conductor firmly pressed against and centered over the adjacent end of the opening in said mask whereby a stripe of coding ink is applied to the conductor as the same is advanced axially past said mask opening.

3,889,634

METHOD OF AND APPARATUS FOR PRODUCING LIQUID IMPREGNATED FIBROUS MATERIAL

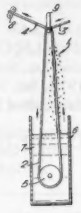
Robert McNaught Gailey, and Joseph John Hurley, both of Paisley, Scotland, assignors to J. & P. Coats, Limited, Glasgow, Scotland

Division of Ser. No. 261,956, June 12, 1972, abandoned. This application Jan. 21, 1974, Ser. No. 435,269

Claims priority, application United Kingdom, June 17, 1971, 28362/71

Int. Cl. B05c *5/00*

U.S. Cl. 118—325 9 Claims



1. Apparatus for producing liquid-impregnated fibrous material comprising means for feeding continuously forward material from a source of supply of unimpregnated material guiding means for guiding the forwardly moving material in a path forming a loop, means for maintaining the material approaching the loop and the material receiving from the loop in contact and liquid-applying means for applying impregnating liquid to the loop over a chosen extent of the loop.

3,889,635

APPARATUS FOR PRODUCING EPITAXIAL LAYERS

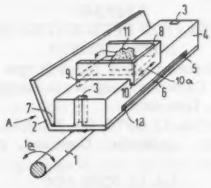
Joerg Aengenheister, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 3, 1974, Ser. No. 485,448

Claims priority, application Germany, July 5, 1973, 2334306

Int. Cl. B05c *3/18*

U.S. Cl. 118—421 8 Claims



1. An apparatus for the production of epitaxial layers on a substrate composed of a compound semiconductor material, comprising:

a substrate carrier having at least two adjoining surfaces;

a high-heat capacity body in contact with one of said surfaces of the substrate carrier and adjacent the other of said surfaces of the substrate carrier;

an area along contacting surfaces of said carrier and body defining a gap for receiving at least one substrate therein;

an area along non-contacting surfaces of said carrier and body defining a wedge-shaped slot in communication with said gap;

a container for holding a melt containing the material to be epitaxially deposited, said container being positioned on said high-heat capacity body and in communication with said slot; and

a selectively movable shaft attached to said substrate carrier so that upon movement of said shaft the melt is guided from said container through said slot to said gap and onto a surface of a substrate within said gap for epitaxial deposition thereon upon super-cooling of said melt.

3,889,636

COATING OF SUBSTRATES WITH PARTICLE MATERIALS

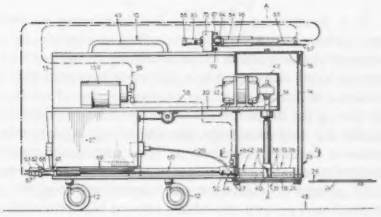
Willoughby Arthur Smith, The Mead, Sidcot, Winscombe, England

Filed Dec. 29, 1972, Ser. No. 319,381

Claims priority, application United Kingdom, Aug. 2, 1972, 36087/72

Int. Cl. B05c *5/02*

U.S. Cl. 118—621 6 Claims



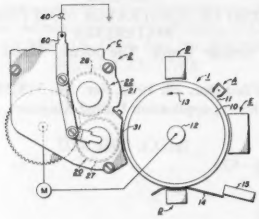
1. Apparatus for electrostatically applying a coating of a particle material to a substrate to which a settable adhesive has been applied, the apparatus comprising a container for a stock of particle material; a single metering means comprising a chamber supplied with particle material from the container and comprising a base and an upstanding peripheral wall, and a power rotatable paddle wheel having blades which are adapted to sweep the volume of the chamber on rotation of the paddle wheel and between adjacent blades there being defined compartments, each adapted to contain a predetermined amount of particle material, the paddle wheel having an axis of rotation which is disposed vertically, said chamber having two alternatively openable exits, one exit being disposed in the base and the other exit being disposed in said upstanding peripheral wall, a manually portable discharge head being provided in communication with said other exit, and said one exit constituting a downwardly directed discharge head; said single metering means serving to meter the amount of particle material supplied to the discharge heads; the apparatus further including an electrostatic generator; main electrode means electrically connected to said generator and disposed in said chamber to electrically charge the particle material therein; and subsidiary electrode means electrically connected to said generator and associated with said portable discharge head.

3,889,637

SELF-BIASED DEVELOPMENT ELECTRODE AND REPRODUCING MACHINE EMPLOYING SAME

Arthur J. North, Rochester, and Raymond W. Stover, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed June 28, 1973, Ser. No. 374,295
Int. Cl. G03g 13/06
U.S. Cl. 118—637 20 Claims



1. In a developing apparatus for developing electrostatic charge patterns on a surface, including an electrically biased development electrode in close proximity to said surface, said electrode being connected to a reference potential through an impedance means so that the charge produced on the electrode during the development of said pattern provides the bias potential for said electrode, the improvement wherein, said impedance means comprises: at least one zener diode connected between said electrode and said reference potential so that the charge produced on said electrode during the development of said pattern provides a reverse bias potential across said zener diode to cause it to stabilize the bias potential on said electrode at a desired level.

3,889,638

METHOD FOR MAKING A BAIT BEDDING COMPOSITION

Patrick F. Riley, Bedford, Ohio

Filed Mar. 21, 1972, Ser. No. 236,778
Int. Cl. A01k 67/00
U.S. Cl. 119—1 2 Claims

1. The method of making a bedding composition for live bait, comprising shredding newspaper, stirring the shredded newspaper until saturated in water, and adding coal tar dye to said composition for coloring said water and said composition.

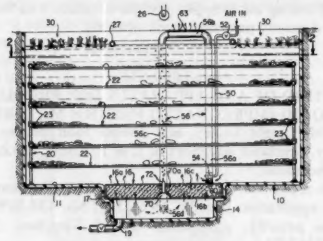
3,889,639

REARING TANK FOR AQUATIC ANIMALS

John J. Day, and Paul S. Hirschman, both of Fort Lauderdale, Fla., assignors to Ocean Protein Corporation, Dania, Fla.

Filed Feb. 22, 1973, Ser. No. 334,622
Int. Cl. A01k 61/00
U.S. Cl. 119—2 11 Claims

1. Apparatus for maturing movable aquatic animals comprising a liquid containing tank with a top open to the environment for holding fluid, a plurality of platforms of foraminous material located within said tank across which the animals can move unobstructed, means for stacking said platforms spaced vertically one above the other, and means located below the lowermost platform of the stack of platforms for circulating



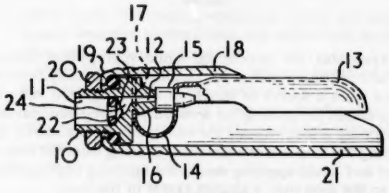
the liquid through the tank while filtering the same, the filtered liquid passing upwardly through said platforms.

3,889,640

ANIMAL OPERATED LIQUID DISPENSER

George Restall, 27 Little Aston Ln., Sutton Coldfield, England

Filed Oct. 1, 1973, Ser. No. 402,053
Claims priority, application United Kingdom, Oct. 10, 1972, 46554/72
Int. Cl. A01k 7/00
U.S. Cl. 119—75 10 Claims



1. A liquid dispenser for animals comprising means of connection to a supply of liquid to be dispensed, a body member, a valve arrangement including an aperture defined in said body member, a valve closure element for closing said aperture at its downstream end, a leaf spring secured to said body member and carrying said valve closure element so as to urge said element towards its valve closing position, and an operating member arranged to move said closure element from a valve closing towards a valve opening position.

3,889,641

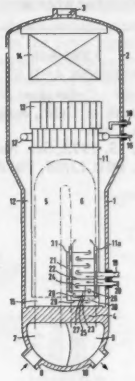
STEAM GENERATOR FEED-WATER PREHEATER IMPROVEMENT

Hans Mayer, Bubenreuth, and Heinz-Jurgen Schroeder, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 17, 1974, Ser. No. 434,360
Claims priority, application Germany, Jan. 25, 1073, 2303681
Int. Cl. F22b 1/06
U.S. Cl. 122—32 5 Claims

1. A steam generator comprises a feed-water casing having a steam output outlet, a horizontal tube sheet enclosed by said casing, a plurality of heat-exchanger tubes having ends mounted in said tube sheet and extending upwardly therefrom, a feed-water preheater casing radially enclosing said legs and having a series of vertically interspaced transverse feed-water flow baffles through which said tubes extend and which define alternately horizontally offset flow passages, and a feed-water inlet connecting with the upper portion of said series of baffles for downward flow of feed-water deflected

transversely alternately in opposite directions between said tubes prior to discharge into said feed-water casing; wherein



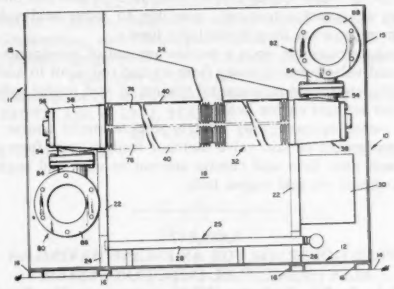
the improvement comprises means for venting steam from beneath at least one of said baffles, upwardly and to a location free from said series of baffles.

3,889,642

MODULAR CAST IRON FIN TUBE BOILER

James Y. Fung, Closter, N.J., assignor to Automation Industries, Inc., Los Angeles, Calif.

Filed Aug. 31, 1973, Ser. No. 393,399
Int. Cl.[2] F22B *15/00*
U.S. Cl. 122—264 **10 Claims**



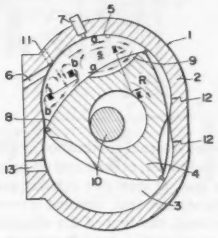
1. The combination of
a combustion chamber,
a cast iron header disposed at each end of the combustion chamber,
a plurality of openings in said headers aligned with each other,
a bundle of case iron, finned tubes disposed in the combustion chamber and extending across said combustion chamber, the opposite ends of the tubes in said bundle being disposed in said aligned openings and communicating with the headers,
the opposite ends of said tubes and said openings being tapered to form a compression seal therebetween.
a tie rod disposed inside of at least one of the tubes, said tie rod extending the full length of the tube and creating a force which compresses the headers onto the tubes and the seal between the ends of the tubes and the openings,
manifolds on the opposite ends of said combustion chamber, each of said manifolds being interconnected with the header on the respective end of the combustion chamber, and
a flue collector disposed above the tubes and enclosing the top of the combustion chamber.

3,889,643

FUEL INJECTION-TYPE ROTARY PISTON ENGINE

Masaharu Shimoji; Haruhiko Satow, and Tetsuo Kawano, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Apr. 25, 1974, Ser. No. 464,616
Claims priority, application Japan, Apr. 30, 1973, 48-48680
Int. Cl. F02b *53/10*
U.S. Cl. 123—8.09 **5 Claims**



1. A fuel injection-type rotary piston engine which comprises in combination:
housing wall means including at least one peripheral wall and side walls secured to both ends of said peripheral wall;
inlet means and outlet means operatively positioned for admission of combustion air to and discharge of exhaust gases from said rotary piston engine;
a polygonal rotor means having rotor flanks and rotatably housed within said housing wall means, each of said rotor flanks having a rotor cavity formed therein, said rotor cavity located on the corresponding rotor flank at a position displaced in the direction of rotation of siad polygonal rotor means;
means operatively coupled to said polygonal rotor means for rotating said polygonal rotor means relative to said housing wall means so as to control the opening and closing of said inlet and outlet means directly by the rotary movement of said polygonal rotor means and also to effectively provide, during the rotary movement of said polygonal rotor means, a suction chamber followed by a combustion chamber in the direction of rotation of said polygonal rotor means, said inlet means being so inclined in a direction substantially parallel to the direction of rotation of said polygonal rotor means as to permit the combustion air, that is to be introduced into the suction chamber therethrough, to be directed toward the area within the suction chamber adjacent the point where an imaginary line drawn through the largest part of the interior of said housing wall means substantially intersects the inner surface of the peripheral wall;
ignition plug means in said housing wall means within the area thereof of said combustion chamber; and
injection means operatively positioned and including a fuel injection nozzle for injecting fuel into said suction chamber.

3,889,644

ENGINE COOLING SYSTEM

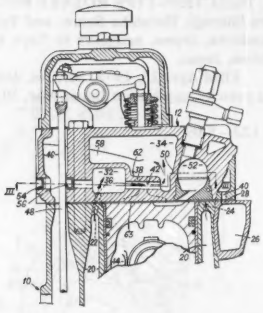
Trevor J. Moore, Bourne, England, assignor to Perkins Engines Limited, London, England

Filed Apr. 10, 1974, Ser. No. 459,843

Claims priority, application United Kingdom, Apr. 12, 1973, 17742/73

Int. Cl. F01p *3/14*

U.S. Cl. 123—41.77 5 Claims



1. A liquid cooled internal combustion engine incorporating a cylinder head and block, at least one air passage terminating at an inlet valve seat, at least one exhaust gas passage terminating at an exhaust valve seat, first and second coolant chambers cast in the head, the first of the chambers being in the form of a gallery extending over the length of the cylinder head, said two chambers having a coolant passage joining them arranged to pass between at least a part of each of the air and the exhaust gas passages, the arrangement being that flow of coolant in the passage acts to cool the metal of the cylinder head between the inlet and exhaust valve, third and fourth coolant chambers cast in the block, said third chamber being positioned beneath said gallery, and a plurality of paired gallery feed ports in the head and block respectively in register with each other to permit coolant to pass from the third chamber to the gallery.

3,889,645

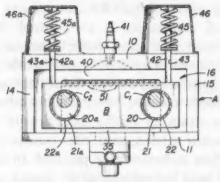
INTERNAL COMBUSTION ENGINE

Robert W. Waters, 301 S. Harrison St., Villa Park, Ill. 60181

Filed Sept. 4, 1973, Ser. No. 394,059

Int. Cl. F02b *53/00*

U.S. Cl. 123—45 R 17 Claims



1. In an internal combustion engine, a casing having front and back sides and providing a cavity therein, a piston block in said cavity and extending between said sides, a shaft mounted in said sides for rotating about a horizontal axis, said shaft having a cylindrical portion whose axis is displaced from the axis of said shaft, a cylindrical opening in said piston block, said cylindrical portion of said shaft entending within said opening and being rotatable therein whereby to couple rotation of said shaft about its axis with reciprocating vertical movement of said piston block, a fuel intake chamber in said cavity below said piston block whereby said intake chamber is expanded upon upward movement of said piston block, a source of fuel, and valve means permitting intake of fuel from said source into said chamber when said chamber is expanded.

3,889,646

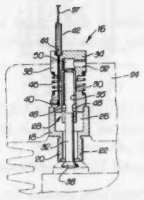
ONE-WAY COMPRESSION AND STARTING RELEASE

Michael Ronald Harper, Cedarpines Park, and Neil David Fergus, Crestline, both of Calif., assignors to Victor Products, Inc., Hesperia, Calif.

Filed Oct. 15, 1973, Ser. No. 406,155

Int. Cl. F01l *13/08*; F02d *15/04*

U.S. Cl. 123—48 D 5 Claims



5. In a two cycle motorcycle engine having means forming a cylinder and said engine having a hole extending from the cylinder, the combination therewith of a compression control device having

a. a valve body attached at said engine hole;

b. a valve member in the body and guided for movement in a path;

c. means forming one limit to the movement of said valve member;

d. spring means urging the valve member to said one limit;

e. an actuator manually operable to move said valve member away from its said one limit;

f. means operable upon a certain amount of movement of said valve member away from its said one limit to add a predetermined incremental volume to said engine cylinder via said engine hole;

g. means operable only after a predetermined course of movement of said valve member farther away from its said limit than said certain amount to vent said engine cylinder via said engine hole.

3,889,647

SPEED GOVERNOR FOR AN ENGINE HAVING AN ELECTRONIC FUEL INJECTION SYSTEM

Todd L. Rachel, Rochester, Mich., assignor to The Bendix Corporation, Teterboro, N.J.

Filed July 2, 1973, Ser. No. 375,580

Int. Cl. B60k *31/00*

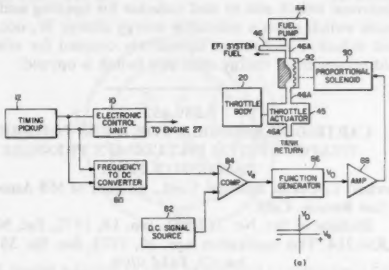
U.S. Cl. 123—102 2 Claims

1. In an internal combustion engine including a fuel control system of the type having sensor means including means for generating an ac. signal at a frequency corresponding to engine speed, responsive to engine conditions operative to provide signals indicative of engine generating parameters, means responsive to the sensor means signals operative to provide a fuel delivery command signal indicative of the engine fuel requirements, fuel supply means responsive to the fuel delivery command signal operative to supply the engine with pressurized fuel in relation to the fuel delivery command signal and means for controlling mixture of fuel and air to the engine, the improvement comprising:

means for providing a d.c. signal corresponding to a predetermined set point speed;

a converter connected to the a.c. signal generating means for converting the engine speed signal therefrom to a d.c. signal;

means for comparing the d.c. set point speed signal and the d.c. engine speed signal and for providing an error signal; means connected to the error signal means for providing a signal as a function of the error signal, the function signal being at a constant level when the error signal is in one sense and increasing linearly when the error signal is in an opposite sense;



fuel regulating means connected to the function signal means and to the fuel supply and responsive to the function signal for regulating said fuel supply, said regulated fuel supply providing a force; and

actuator means connected to the fuel regulating means and to the mixture control means and responsive to said force for actuating the mixture control means to control the mixture of air and fuel to the engine to maintain the predetermined set point speed.

3,889,648

FUEL SYSTEMS FOR ENGINES

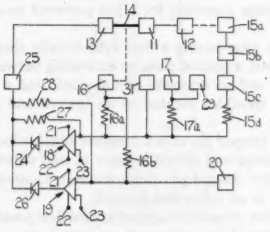
Malcolm Williams, Solihull; Geoffrey Albert Kenyon Brunt, Glastonbury, and Christopher Robin Jones, Alcester, all of England, assignors to C.A.V. Limited, London, England

Filed Apr. 4, 1973, Ser. No. 347,729

Claims priority, application United Kingdom, Apr. 4, 1972, 15341/72; Apr. 4, 1972, 15339/72

Int. Cl. F02m *39/00*

U.S. Cl. 123—139 E **13 Claims**



1. A fuel system for an engine, comprising in combination a pump supply fuel to the engine, an actuator controlling the pump, and an electronic governor for controlling the actuator, said governor receiving electrical signals representing engine speed and at least one further engine parameter, the speed signal being obtained using a transducer producing an a.c. output at a frequency proportional to engine speed, a pump circuit for converting said signal to a d.c. signal, first, second and third supply lines, an operational amplifier having an inverting input terminal and a non-inverting input terminal, said amplifier being powered by the first and second supply lines and having its non-inverting input terminal connected to the third supply line, and said pump circuit including a capacitor across which is developed a voltage proportional to the frequency of the a.c. output, said capacitor being connected across the inverting input and output terminals of said operational amplifier, a resistor across the capacitor, a second capacitor and a diode in series between an input terminal and the inverting input terminal, and a second diode coupling the junction of the second capacitor and first diode to the third supply line.

3,889,649

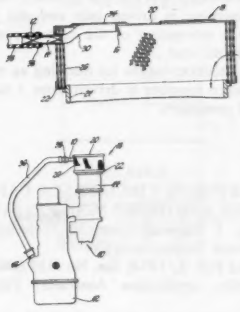
FEED TUBE FLAME ARRESTER

Mardy Polaner, Detroit, Mich., assignor to Barbron Corporation, Detroit, Mich.

Division of Ser. No. 177,235, Sept. 2, 1971. This application Aug. 13, 1973, Ser. No. 387,906

Int. Cl. F02m *17/00, 25/06, 29/00*

U.S. Cl. 123—142 **4 Claims**



1. In a combustion engine having a carburetor for mixing air with fuel, a feed line for conveying combustible gases from a source to the carburetor including an elongated section of closed tube having one open end connected directly to the source and the other end connected to the carburetor so as to pass undiluted gases from the source directly to the carburetor, said tube having an interior flame arresting baffle formed of an elongated strip twisted about its elongated axis and having both of its longitudinal edges fixed to the interior of the tube so that the longitudinal axis of the strip coincides with the longitudinal axis of the tube and having one end terminating at the carburetor end of the tube.

3,889,650

ELECTRIC PULSE GENERATING APPARATUS

Robert Leitch Rivers, Oxted, England, assignor to Mobelec International Limited, Oxted, Surrey, England

Filed Dec. 15, 1972, Ser. No. 315,432

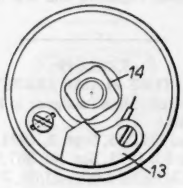
Claims priority, application United Kingdom, Dec. 15, 1971, 58258/71; June 8, 1972, 26783/72

Int. Cl. F02p *1/00*

U.S. Cl. 123—148 E **2 Claims**

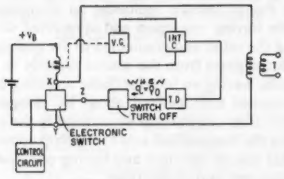
1. In combination with an internal combustion engine, an electrical ignition circuit including a cam-like member of a magnetic material operatively connected to move as a function of engine speed and apparatus for generating electric pulses, said apparatus comprising,

a core member of a magnetic material;
pole pieces formed by exposed faces of said core member;
means for mounting said core member with said pole pieces adjacent said cam-like member;
a coil wound round a portion of said core member for controlling the magnetic flux in said core member;



circuit means operatively connected to said coil for supplying said coil with a direct current of such a magnitude that said core member is driven into and out of magnetic saturation on movement of the cam-like member past said pole pieces; and
desaturation detection means for deriving an electric pulse when said core member is driven from a saturated to a desaturated condition.

3,889,651
ENERGY METERING CIRCUITS FOR CAPACITOR DISCHARGE AND OTHER IGNITION SYSTEMS
George Hudson, 1 Harbour Gate, 10 Wolseley Rd., Point Piper, New South Wales, Australia
Filed Feb. 5, 1974, Ser. No. 439,840
Claims priority, application Australia, Feb. 7, 1973, 2165/73
Int. Cl. F02p 3/02
U.S. Cl. 123—148 E **2 Claims**

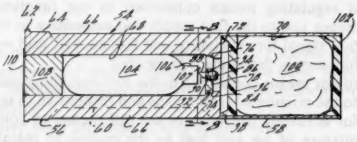


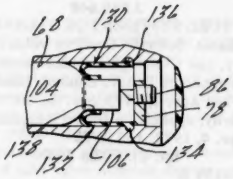
1. An energy metering circuit for an ignition system comprising: an inductor; an electronic switch coupled to said inductor and forming therewith an energy absorption circuit; a battery connected to said energy absorption circuit and connected to said inductor when said electronic switch is closed and disconnected therefrom when said electronic switch is open; control means operatively coupled to said electronic switch for closure thereof; a voltage generator adapted to produce an output nV_L for the duration of closure of said electronic switch, where n is a positive or negative number and V_L is the instantaneous terminal voltage generator and producing an output q, said output q being a repeatable continuous single valued measure of

$$\int_0^t V_L dt,$$

where t is the elapsed time after closure of said electronic switch; a threshold detector coupled to the integrator and producing an output signal whenever the output q of said integrating circuit attains a predetermined value Q_o; means coupled to said electronic switch and said threshold detector for turning off said electronic switch responsive to output from said threshold circuit; means operatively coupled to said electronic switch and to said inductor for opening said electronic switch when a selectable energy change W_o occurs in said inductor; and means operatively coupled for releasing said accumulated energy after said switch is opened.

3,889,652
CARTRIDGE ASSEMBLY FOR A GAS POWERED WEAPON SYSTEM INCLUDING A PRESSURE RESPONSIVE SEAL
Herbert E. Curtis, Danville, Calif., assignor to MB Associates, San Ramon, Calif.
Division of Ser. No. 217,903, Jan. 14, 1972, Pat. No. 3,830,214. This application Apr. 20, 1973, Ser. No. 352,944
Int. Cl. F41d 9/00
U.S. Cl. 124—41 **6 Claims**





2. A cartridge assembly for a gas powered weapon system comprising:
a cartridge case having a first cylindrically shaped passage at one end, a second passage extending between said first passage and an opposite end thereof, and a radially extending shoulder located at an inward end of said first passage;
a first disc shaped gas check member slidably located in said first passage and seated relative to said shoulder;
a second disc shaped gas check member located in said first passage at an outer end thereof;
a deformable projectile located in said first passage between said first and second gas check members;
a trasversely extending partition wall located at an inward end of said second passage, said wall including passage menas for fluidly communicating said first and second passages;
a pressurized gas bottle slidably located in said second passage;
means carried by said partition wall for puncturing said bottle and releasing said pressurized gas in response to displacement of said bottle in a first direction; and
pressure responsive sealing means located in said second passge for self-sealing said second passage relative to said

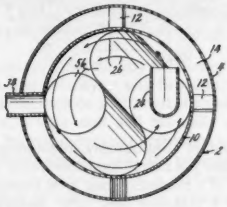
bottle, said last mentioned means being urged in an opposite direction relative to said first direction to a self-sealing position in response to release of said pressurized gas.

3,889,653

WOOD BURNING HEATER

Clifford A. Scogin, 427 Vassar, Sugar Creek, Mo. 64053

Filed Mar. 4, 1974, Ser. No. 447,539
Int. Cl. F24h *3/06*
U.S. Cl. 126—110 R **12 Claims**



1. A heater adapted to burn wood, coal or other solid fuel, and comprising:

a. a hollow vertically elongated combustion chamber adapted to contain said solid fuel to be burned, and having combustion air inlet and outlet openings both disposed at or closely adjacent the top thereof, but being otherwise sealed, and

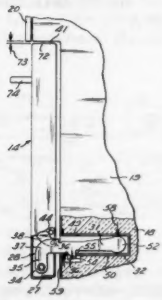
b. a blower fan operable to introduce a current of air into said combustion chamber through said inlet opening to supply oxygen for the combustion of said fuel, said fuel being initially ignited by other means.

3,889,654

SELF-LOCKING OVEN DOOR HINGE

Herbert A. Kauranen, Granville, and Alvin J. Schettl, Grand Rapids, both of Mich., assignors to Kelvinator, Inc., Grand Rapids, Mich.

Filed Dec. 26, 1973, Ser. No. 428,085
Int. Cl. F24c *15/02*
U.S. Cl. 126—194 **9 Claims**



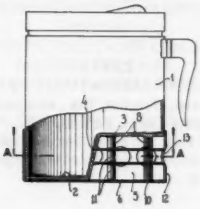
1. A range comprising a cabinet assembly having an oven chamber, and a door assembly, including a lower hinge, adapted to be removably mounted on the cabinet assembly, the door assembly being in a closed position when vertically disposed and being pivotal away from the oven chamber about a horizontal hinge axis adjacent its lower edge, releasable locking means adjacent the lower door hinge for retaining the lower door hinge on the oven chamber, said releasable locking means including interengaging elements associated with said door assembly and said cabinet assembly, said releasable locking means allowing separation of said door assembly from said cabinet assembly when the lower edge of the door assembly is raised a predetermined distance from a normal locked position, door latching means operative to prevent the door from being opened when the internal temperature of the oven chamber is above normal baking temperatures, and means preventing the lower door edge from being lifted said predetermined distance when said door latching means is operative on said door assembly and allowing said lower door edge to be lifted said predetermined distance when said door latching means is not operative wherein said door lift prevention means includes a first surface fixed relative to the cabinet assembly and a second surface fixed relative to the door assembly engageable with said first surface when said door assembly is vertically disposed, said first and second surfaces being arranged relative to one another in a manner which, when in engagement, prevents said door from being lifted through said predetermined distance.

3,889,655

CONTAINER FOR BOILING MILK

David Enrique Ayora, Roque Saenz Pena 4445, Buenos Aires, Argentina

Filed Apr. 19, 1974, Ser. No. 462,571
Int. Cl. A47j *27/00*
U.S. Cl. 126—387 **5 Claims**



1. Apparatus for boiling milk, comprising; a container having a generally vertical, generally cylindrical wall; a lower flat base wall disposed in a lower part of the container; an upper flat base wall parallel to the lower one and in a position staggered with respect to the same; an intermediate upright wall interconnecting the lower and upper flat walls and cooperating with them to close a lower part of the container; a metal bottom disc below and in surface contact with the lower flat wall and defining with the upper flat wall a cooling space in the lower part of the container; and a plurality of cooling plates mounted in said cooling space; whereby milk can be heated for boiling through said disc and said lower flat wall while being relatively cooled by said upper flat wall and said cooling plates in said cooling space to avoid boiling over of the milk.

3,889,656

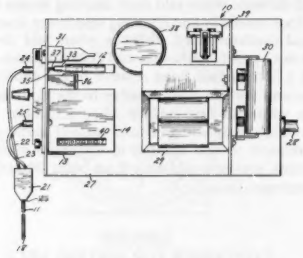
METHOD OF DETERMINING THE PRESENCE OF CALCULI IN BODY CAVITIES

Donald R. Krawitt, Rye, N.Y., assignor to Mount Sinai School of Medicine of the City University of New York, New York, N.Y.

Division of Ser. No. 223,184, Feb. 3, 1972, Pat. No. 3,809,066. This application Mar. 19, 1974, Ser. No. 452,633
Int. Cl. A61b *5/06*
U.S. Cl. 128—2 R **1 Claim**

1. The method of determining the presence of agglomerated calculi in body cavities comprising the steps of: providing a light-conductive fiber optic probe having a first end suitable for insertion into said cavity, said probe having first and second groups of optical fibers having first terminals in mutually

juxtaposed position at one end of said probe, and second and third terminals in mutually spaced position at an opposite end thereof; introducing a beam of collimated light to said second terminal for conduction to said first terminal, introducing said first terminal into said cavity, manually manipulating the end



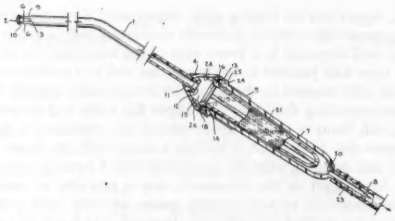
of said first terminal within said cavity substantially along the axis of said probe to contact possibly present particles of calculi, and observing quantitative changes in the intensity of light reflected back through said probe at said third terminal when said first terminal contacts agglomerated calculi.

3,889,657

UTERINE ASPIRATING CURETTE

Carl B. Baumgarten, Houston, Tex., assignor to Gomco Surgical Manufacturing Corp., Buffalo, N.Y.

Filed Feb. 12, 1974, Ser. No. 441,805
Int. Cl.[2] A61B *10/00, 17/22*
U.S. Cl. 128—2 B **11 Claims**



1. A uterine aspirating curette comprising

a tube closed on one end by a tip and having a plurality of equally spaced openings about the circumference thereof, juxtaposed to said tip, said tip having substantially the same outside diameter of said tube adjacent to said openings said tube being fixedly attached to a base, said base having a chamber therein, said tube communicating with said chamber by a passage,

a hollow handle, said base being removably mounted thereon and said chamber communicating with said hollow handle, said handle being adapted for manipulating said curette in use,

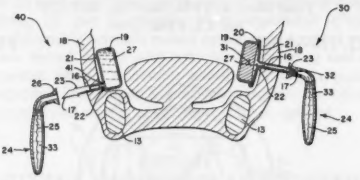
a substantially porous basket for receiving an aspirated specimen, said basket being removably mounted in said handle, juxtaposed to said chamber and in alignment with said tube, said basket having an enclosed non-porous end forming a cup, and a means for attaching said handle to a vacuum source.

3,889,658

VIVO TEMPERATURE SENSING METHOD AND APPARATUS

Jay H. Newhall, Bozeman, Mont. 59715

Continuation-in-part of Ser. No. 333,695, Feb. 20, 1973, abandoned. This application Apr. 8, 1974, Ser. No. 458,647
Int. Cl. A61b *5/02, 10/00*
U.S. Cl. 128—2 H **20 Claims**



1. The method of continuously monitoring an animal to determine whether the animal has experienced a body temperature in excess of a predetermined level comprising:

a. providing a reservoir and tube assembly, containing therein a first reactant and a barrier to movement of said first reactant through said tube and outwardly therefrom, said barrier being displaced upon said assembly reaching said predetermined temperature to permit said first reactant to pass outwardly therefrom;

b. inserting the tube portion of said assembly through the cheek of said animal from the inside so as to leave at least the reservoir portion of the assembly in the animal's mouth; and

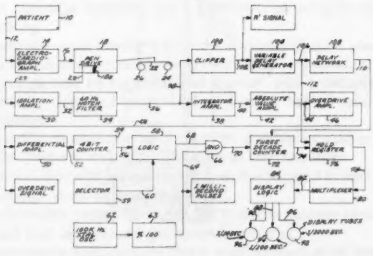
c. joining an indicator tag portion including a cavity containing a second reactant so as to be in fluid communication with the end of said tube projecting outwardly from said animal so that upon said animal attaining a temperature in excess of said predetermined mimimum the barrier means is displaced and said first reactant will enter said cavity portion of said tag and react with second reactant to produce a color change.

3,889,659

DIGITAL ELECTROCARDIOGRAPH INTERPRETER

Bill N. Lutes, 3637 Pine Ave., Long Beach, Calif. 90807

Filed Dec. 5, 1973, Ser. No. 421,785
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06 A **3 Claims**

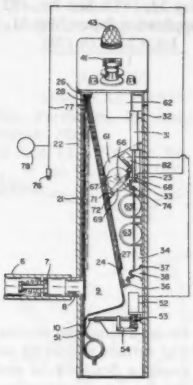


1. In combination with an electrocardiograph assembly that includes a solenoid-operated recorder pen drive coil that receives EKG electrical signals from a patient and visually records a graph thereof on an elongate strip of moving paper, a device for selectively displaying a digital form, the time interval required to form a selected wave or group of waves in said signal along the X axis thereof, said signal including P, R, T and U positive waves and Q and S negative waves, said device including:

a. an electrical conductor that receives the EKG electric signal from said solenoid that drives said recorder pen;
b. first means that includes an isolation amplifier and filter for receiving said EKG signal from said electrical conductor and which filters electric signals therefrom that originate from a source of domestic electric power;
c. second means for dividing the filtered EKG signal from said first means into first and second signal portions;
d. third means that include an integrator amplifier, absolute value amplifier and overdriven amplifier for receiving said first signal portion and thereafter sequentially removing noise from said first signal portion, inverting the Q and S waves of said first signal portion, and squaring said P, Q, R, S, T and U waves to provide an overdriven signal;
e. an and-gate having first and second inputs and an output;
f. fourth means for continuously delivering spaced electric pulses of a first polarity to said first input;
g. fifth means that include a differential amplifier, a multiple bit counter, a logic unit and manually operated signal controlled by said overdriven signal for selectively delivering an electric signal of said first polarity to said second input during the time interval a predetermined and selected portion of said EKG signal is being formed;
h. a multiple decade counter that receives said spaced electric pulses from said output of said and-gate;
i. a hold register that receives the output from said multiple decade counter;
j. a multiplexer in electrical communication with said hold register;
k. first second and third display tubes that indicate by digits thereon, thousandths, hundredths and tenths of a second;
l. sixth means in electrical communication with said multiplexer and first, second and third display tubes, said sixth means being actuated by the output from said multiplexer to actuate said display tubes to visually indicate the time duration required to form said selected portion of said EKG signal;
m. seventh means for eliminating all but said R wave from said second signal portion;
n. eighth means for storing said R wave of said second signal as an electric pulse until just prior to the forming of the P wave of the following EKG signal;
o. ninth means for using a portion of said stored electric pulse to cause the information in said counter to be transferred to said register just prior to said P wave of the following EKG signal; and
p. tenth means for using a portion of said stored electric pulse to clear said hold register prior to said information in said counter being transferred thereto.

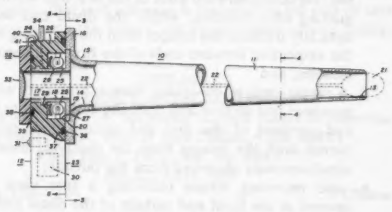
3,889,660
SPIROMETER
Sotiris Kitrilakis, Berkeley, Calif., assignor to Searle Cardio-Pulmonary Systems Inc., Emeryville, Calif.
Filed Oct. 4, 1973, Ser. No. 403,467
Int. Cl. A61b *5/08*
U.S. Cl. 128—2.08 **9 Claims**

7. In a spirometer, having a frame establishing a stationary surface adapted to receive an air bag thereagainst, a primary plate, means mounting said primary plate on said frame for free swinging movement toward and from said stationary surface in a predetermined path, the improvement comprising: means for indicating the position of the primary plate relative to said frame; a secondary plate, means mounting said secondary plate on said frame for swinging movement relative to said stationary surface in said predetermined path, and means for swinging said secondary plate in said predetermined



path and into and away from abutment with said primary plate.

3,889,661
SPECULUM INSTRUMENT AND ISOLATED LIGHT MEANS THEREFOR
John M. Fiore, Troy, N.Y., assignor to Bio-Analytical Labs, Inc., Troy, N.Y.
Division of Ser. No. 249,110, May 1, 1972, abandoned, which is a division of Ser. No. 878,655, Nov. 21, 1969, Pat. No. 3,675,641. This application Dec. 3, 1973, Ser. No. 421,078
Int. Cl. A61b *1/06*
U.S. Cl. 128—6 **6 Claims**



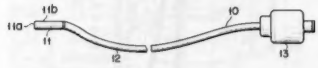
1. In a speculum instrument including a speculum barrel and obturator assembly wherein said barrel includes a smaller diameter flanged sleeve means with the flange engaging said barrel and said sleeve projecting from the proximal end of said barrel and through which said obturator may be withdrawn the improvement of a handle lighting unit adapted to receive said sleeve therein comprising in combination
a. a handle part,
b. an annular lighting head part on said handle part and adapted to fit over said sleeve,
c. a concentric ring of lamps positioned in said annular lighting head and closely surrounding said sleeve to pass light directly through said flange and into the bore of said barrel,
d. releaseably securing means in said annular lighting head to releaseably secure said barrel to said annular lighting head
e. and means to sealingly engage said annular lighting head part to said barrel around said lamp ring.

3,889,662

ENDOSCOPE

Kazuhiko Mitsui, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 24, 1974, Ser. No. 472,988
Claims priority, application Japan, May 31, 1973, 48-64209
Int. Cl. A61b *1/06*
U.S. Cl. 128—6 8 Claims



1. An endoscope having a distal end section and a front end surface and a side end surface and being adapted to be inserted into a body cavity, a flexible tube section having one end connected to the distal end section so as to facilitate guiding the distal end section into the body cavity, and a proximal end section connected to the other end of the flexible tube section so as to control the insertion of the distal end section, said endoscope comprising:

a. first and second image guiding fiber bundles having forward ends and base end portions extending respectively from the distal end section through the flexible tube section into the proximal end section to permit images of the internal wall of the body cavity to be transmitted from the respective forward ends thereof to the respective base end portions thereof, said base end portions of the first and second fiber bundles having respective image delivering end surfaces;

b. receiving means provided at the distal end section so as to receive the images into the distal end section;

c. first and second optical means provided, in proximity to the respective forward ends of the first and second image guiding fiber bundles, within the distal end section to optically transmit the images from the receiving means to the respective forward ends of the first and second fiber bundles; and

d. a single optical observing means provided within the proximal end section and optically connected to the base end portions of the first and second fiber bundles to permit both the images from the receiving means to be simultaneously observed from the outside;

e. said receiving means including a first view window opened at the front end surface of the distal end section and a second view window opened at the side end surface of the distal end section, said first and second view windows optically leading to said first and second optical means, respectively.

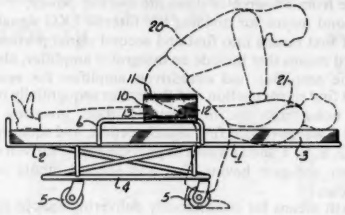
3,889,663

AMBULANCE COT WITH CARDIOPULMONARY RESUSCITATION SEAT AND METHOD OF ADMINISTERING CARDIOPULMONARY RESUSCITATION

Robert B. Fryer, 723 Washington Ave., Bridgeville, Pa. 15017

Filed Jan. 24, 1974, Ser. No. 436,034
Int. Cl. A61h *31/00*
U.S. Cl. 128—28 6 Claims

1. In combination, an ambulance cot having side rail means on the sides thereof, and a rigid removable cardiopulmonary resuscitation seat transversely bridging said cot and supported from said side rail means, said seat adapted to support the weight of a human to administer cardiopulmonary resuscitation to a patient on said cot with means to support the administrator's feet on opposite sides of said cot.

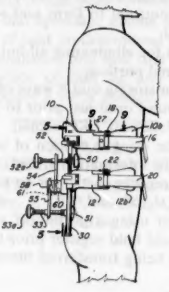


3,889,664

AMBULATORY TRACTION TREATMENT APPARATUS

Gordon D. Heuser, 2514 Stacy Ct., Colorado Springs, Colo. 80915, and Rolla J. Pennell, 10701 Winner Rd., Independence, Mo. 64052

Filed May 13, 1974, Ser. No. 469,558
Int. Cl.² A61H *1/02*
U.S. Cl. 128—75 3 Claims



1. In an ambulatory traction treatment apparatus having a pair of spaced apart upper and lower torso belts tightenable on a torso by straps depending from each end of said belts, and a pair of spaced-apart tensioning jack screws therebetween for moving said belts apart, the improvement of a pair of mounting means for each said jack screw on the upper torso belt inclusive of ratchet means for rotating each said screw in opposite directions, a pair of mounting means on the lower torso belt inclusive of releasable tooth means for holding each said screw for tensioning and for immediate release of tension, and adjustable mount means on the lower belt holding a pair of spaced-apart lordosis pads, including means for applying forward pressure to said lordosis pads against vertebrae of a patient, said adjustable mount means includes a pair of passage means, an elongated holder for each lordosis pad mounted in each said passage and spring bias means in each said passage of said mount means for frictionally holding each said elongated holder at a predetermined position for prepositioning said lordosis pads.

3,889,665

APPARATUS AND METHOD FOR PRESSURIZING GAP-FILLING CEMENT TO A CONCAVELY RELIEVED SITE IN A BONE

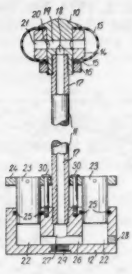
Robin Sydney Mackwood Ling, Teignmouth, and Alan John Clive Lee, Exeter, both of England, assignors to National Research Development Corporation, London, England

Filed Mar. 7, 1973, Ser. No. 338,931

Claims priority, application United Kingdom, Mar. 8, 1972, 10794/72

Int. Cl. A61f *5/00*

U.S. Cl. 128—92 R 10 Claims



1. Apparatus for pressurizing gap-filling cement applied to a concavely relieved site in a bone, said apparatus comprising

a. means for extruding said cement into said bone by longitudinal application thereof to said cement in one area of said site, said means comprising an elongate extrusion member having a solid end portion thereof for forcible application to said cement, and

b. an inflatable resilient annular sealing member fixably and sealably connected around said extrusion member adjacent said solid end portion thereof to cover the remaining area of said site around said extrusion member for reducing the outward escape of cement therefrom when pressurized by application of said extrusion member.

3,889,666

METHOD OF PREPARATION FOR/AND INSERTION OF IUD PREPACKAGED IN A TUBULAR INSERTER

Irwin S. Lerner, Greenwich, Conn., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Division of Ser. No. 187,373, Oct. 7, 1971, abandoned. This application Sept. 10, 1973, Ser. No. 395,840

Int. Cl. A61f *5/46*

U.S. Cl. 128—127 5 Claims

1. A method of preparing a resilient intrauterine device for high fundal positioning in a uterine cavity comprising the steps of: partially housing said intrauterine device in an expanded, substantially undeformed configuration within a tubular inserter, rearwardly of a forward, expulsion end of said inserter; and moving said intrauterine device forwardly, toward the expulsion end of said inserter, into an elongate deformed attitude entirely within the tubular inserter.

3,889,667

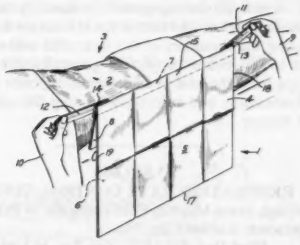
SURGICAL DRAPE

Robert F. Collins, Barrington, Ill., assignor to The Kendall Company, Walpole, Mass.

Filed Sept. 11, 1974, Ser. No. 505,017

Int. Cl. A61f *13/00*

U.S. Cl. 128—132 D 11 Claims



1. An improved self-adhering drape for surgical or medical-type procedures, comprising

a. a sheet of material having a plurality of edges, including at least one side edge,

b. a first fold line disposed between said edges defining a major and a minor portion,

c. an adhesive area on said drape disposed adjacent first fold line, and extending to said side edge,

d. a taping releasably secured to said adhesive area,

e. said taping having at least one tab,

f. said tab, taping and adhesive being cooperatingly disposed so that said adhesive is revealed on the side of said drape facing the area of use upon release of said taping.

3,889,668

EMERGENCY MEDICAL HARNESS

David J. Ochs, 707 W. Magnolia St., and James D. Behrens, 1016 McHugh St., both of Fort Collins, Colo. 80521

Filed July 1, 1974, Ser. No. 484,577

Int. Cl. A61f *5/04*

U.S. Cl. 128—134 9 Claims

1. In an emergency medical harness in combination with a solid rigid planar back support, the improvement comprising: a plurality of elongated flexible straps each oriented in a given direction, said straps being laterally spaced successively one from the next;

an effective plurality of flexible webs disposed across the central regions of said straps, each web being oriented in a direction perpendicular to said given direction and said webs being laterally spaced successively one from the next;

the combination of said straps and webs forming a matrix of length and width to cover approximately the front upper torso of a wearer;

means fastening individual different portions of said straps to corresponding different portions of said webs at the mutual crossings of said straps and webs;

means for releasably and adjustably securing each outer end portion of each of said straps effectively back upon itself to form a loop engageable around a portion of said solid support, placed behind the wearer, to bind the wearer firmly to said support;

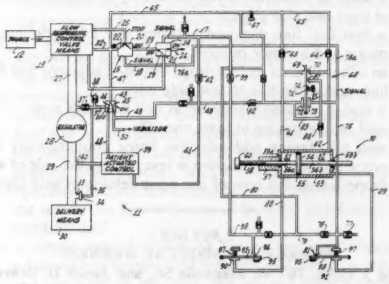
upper means projecting generally laterally to said straps from one end of said matrix for releasably and adjustably binding the shoulders of the wearer to said solid support; and lower means projecting generally laterally to said straps from the end of said matrix opposite said one end for releasably and adjustably binding the upper thighs of the wearer.

3,889,669

RESPIRATION RATE CONTROL SYSTEM

James Weigl, Santa Monica, Calif., assignor to Puritan-Bennett Corporation, Kansas City, Mo.

Filed Dec. 11, 1972, Ser. No. 313,984
Int. Cl. A61m *16/00*
U.S. Cl. 128—145.8 **19 Claims**



19. For use with a respirator apparatus for delivering gas from a source of gas under pressure cyclically to a patient through delivery means, a rate control system for timing successive breathing cycles each having an inspiration phase followed by an expiration phase, said system comprising:

timing chamber means of preselected volume for timing each breathing cycle, said timing chamber means including first and second chambers;

means for charging to a preselected pressure level said first chamber during the inspiration phase, and said second chamber during the expiration phase, with fluid entering at a preselected flow rate, thereby to time each breathing cycle;

a single rate control means for selectively adjusting the flow rate to vary the breathing cycle time;

pressure-actuated means coupled with said timing chamber means, for terminating the inspiration phase and initiating the expiration phase, and thereby dividing the breathing cycle time in a preselected ratio of inspiration time to expiration time; and

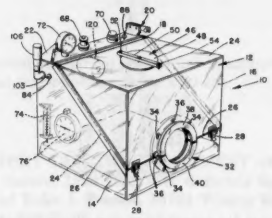
a single ratio control means for selectively varying the ratio of inspiration time to expiration time independently of the breathing cycle time, said ratio control means including a movable piston separating said first and second chambers, whereby movement of said piston changes the ratio of inspiration time to expiration time independently of the breathing cycle time, by varying the ratio of the volumes of said first and second chambers independently of their total volume.

3,889,670

NON-INVASIVE HYPERBARIC VENTILATOR

Steven R. Loveland, 601-B Jersey Ave., and Roy L. Campbell, Cedar Lane Park No. 25, Old Greensboro Rd., both of Winston-Salem, N.C. 27101

Filed Jan. 2, 1974, Ser. No. 429,534
Int. Cl. A61m *16/02*
U.S. Cl. 128—204 **10 Claims**



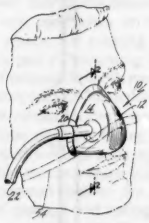
1. A non-invasive hyperbaric ventilator comprising a rigid chamber having a base structure, rear, front, top and side walls, a hinged hood formed from portions of said front, side and top walls, means for sealing said hood in the chamber closed position, a collar assembly having an opening for receiving the neck of a patient, said collar assembly having one portion in the portion of the front wall of said hood and a cooperating portion in the other portion of said front wall, sealing means closing said opening in said collar assembly and engaging the neck of a patient and said chamber to seal the patient's head within said chamber to effect an air-tight chamber, means, including a gas inlet port, for regulating the therapeutic pressure within the chamber to a predetermined level and intermittently controlling the supply of gas to said chamber and facilitating expansion of the patient's lungs during inspiration, and adjustable expiratory pressure relief means communicating with said chamber for permitting displacement of a volume of gas from said chamber when the patient exhales.

3,889,671

NASAL ADAPTER FOR ADMINISTERING ANALGESIC GAS

Alfred Baker, 153 E. Central Ave., Pearl River, N.Y. 10965

Filed Feb. 19, 1974, Ser. No. 443,715
Int. Cl. A61m *17/00*
U.S. Cl. 128—206 **10 Claims**



1. An improved nasal adapter for administering gas analgesia which comprises a nosepiece for covering the nose and

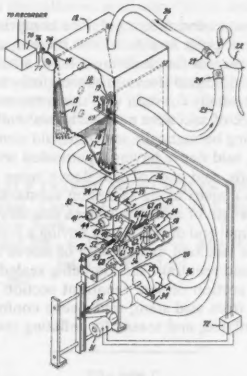
means for connecting the nosepiece with a source of gaseous analgesia, said nosepiece being provided with respiratory check valves for associated air intake and expiration with each respective check valve being in turn provided with adjustable regulatory controls for air intake and expiration and sealing means being provided for said nosepiece, so that when said adapter is placed over the nose there will be allowed into said adapter the introduction of a mixture of gaseous analgesia and air and the expiration of the residue of said mixture from said adapter, in controlled amounts and wherein said nosepiece has opposing lateral sides, an underside, a closed side and an open side, the air intake respiratory check valve being located in one of said lateral sides, said source of gaseous analgesia being introduced through the other said lateral side, and the expiration respiratory check valve being located in said underside and includes means for directing the expiration of the residue of gaseous analgesia and air downwardly and towards the open side of said nosepiece.

3,889,672

OPEN CIRCUIT SYSTEM FOR RESPIRATION TESTING

Sabbo Woldring, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 27, 1973, Ser. No. 391,591
Int. Cl. A61b 5/08
U.S. Cl. 128—208 7 Claims



1. An open-circuit device for respiration testing comprising in combination:

a. a first enclosure of fixed dimension,

b. a spirometer connected to said enclosure so as to be actuated by changes in gas volume occurring within the confines of said first enclosure,

c. a second enclosure having expansible/contractible wall area, said second enclosure being located within said first enclosure,

d. a mouthpiece adapted to be worn by the subject to be tested, a first conduit connected between said mouthpiece and said first enclosure and a second conduit connected between said mouthpiece and said second enclosure, first valve means connected in one of said first and second conduits to provide flow only to said mouthpiece and second valve means connected in the other of said first and second conduits to provide flow only away from said mouthpiece,

e. first means for controllably displacing a gaseous volume, said volume displacing means being connected to said first enclosure,

f. a second means for controllably displacing a gaseous volume, said volume displacing means being connected to said second enclosure, said first and second volume displacement means being synchronized to simultaneously remove gas from one of said enclosures and introduce gas into the other of said enclosure with the volumetric rates of removal and introduction being substantially equal, said first and second conduits being connected to direct exhaled breath to said one of said enclosures and enable inhalation from said other of said enclosures and

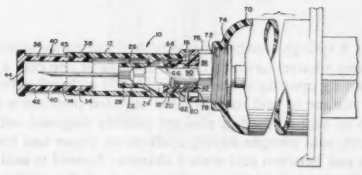
g. means responsive to the expansion and contraction of said second enclosure for controlling simultaneous intermittent operation of said first and second volume displacement means.

3,889,673

TIP ASSEMBLY FOR SYRINGES

Brian H. Dovey, Rockville, Md.; Elliot Bartner, Piscataway, N.J.; Sheldon Kaplan, Potomac, and Stanley J. Sarnoff, Bethesda, both of Md., assignors to Survival Technology, Inc., Bethesda, Md.

Filed Jan. 2, 1974, Ser. No. 429,850
Int. Cl. A61m 5/32
U.S. Cl. 128—215 2 Claims



2. A tip assembly adapted for use in conjunction with a medicament container from which the medicaments are removed by a needle wherein the dispensing end of the container has a body portion from which extends an outer sleeve having its inner surface threaded, and an inner sleeve also extending forwardly from said body, the inner sleeve being positioned within and spaced from the outer sleeve, said inner sleeve being tapered so as to enlarge in the direction of the body and in communication with the medicament in the container, said tip assembly comprising:

a cylindrical main body, said main body having an open forward end and a partially closed back end, the inner surface of the main body adjacent the back end having circumferential sealing means extending inwardly therefrom, said sealing means being adapted to sealingly engage the outer surface of the outer sleeve on the medicament container when the tip assembly is operatively connected to said container,

an inner cylindrical body within and coaxial with the main body forwardly of the sealing means, means connecting the inner body to the main body to retain the aforesaid spaced relation, the inner surface of the inner body being hexagonal in cross section,

a cap fitting over the open end of the main body, said cap having a cup-shaped configuration including a bottom and a cylindrical wall extending therefrom, cooperating retaining means on the outer surface of the cap wall and the inner surface of the main body to hold the cap on the main body,

a needle assembly carried within the main body by the inner body, said needle assembly comprising a hub member having an enlarged rear portion adapted to engage the threads on the inner surface of the outer sleeve of the container, a hexagonally shaped middle portion and a forward portion of smaller diameter than the middle portion, the hub having a hole extending completely therethrough, a needle fixedly mounted in the forward portion of the hub, the rearward portion of the hub hole

being sized to conformingly engage the tapered inner sleeve of the container, the hexagonal portion of the hub being sized to operatively fit into the hexagonal inner surface of the inner body whereby the needle assembly is firmly held in position within the main body, and

whereby when the tip assembly is operatively mounted on the dispensing end of the container all of the components of the tip assembly remain in fixed position during use except for the cap which is removed to expose the needle prior to use.

3,889,674

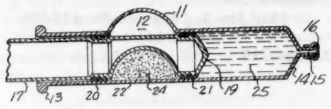
MIXING SYRINGE

Constabile A. Cilento, 11 Grandview, Bridgeton, N.J. 08302

Filed Nov. 30, 1973, Ser. No. 420,641

Int. Cl. A61m *5/22*

U.S. Cl. 128—218 M **14 Claims**



1. A syringe capable of storing and mixing substances comprising a barrel having a nipple opening at one end, a plunger receiving opening at the other end, and a chamber formed on the surface of said barrel by the outward protrusion of a section of said surface; a plunger slidably disposed within said barrel, said plunger having seals on an upper and lower portion and between said seals a chamber formed in said plunger by the inward intrusion of a section of the surface of the plunger surface, said plunger being rotatable in said barrel to align said outward protrusion and said inward intrusion to form a single chamber for mixing of a substance contained within the syringe.

3,889,675

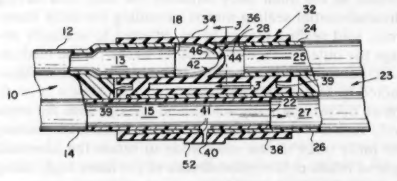
SUCTION-IRRIGATOR

James M. Stewart, West Palm Beach, Fla., assignor to Stewart Research, Inc., West Palm Beach, Fla.

Filed June 25, 1974, Ser. No. 482,878

Int. Cl. A61m *3/00*

U.S. Cl. 128—240 **12 Claims**



1. A suction-irrigating instrument comprising:

a. a working tip structure having first and second passages for delivering fluid and applying a vacuum respectively to a work area;

b. a supply handle structure having first and second passages for supplying fluid and vacuum from sources of supply;

c. means for connecting said passages in the handle structure to a supply of fluid and a source of vacuum; and

d. means for connecting the passages in the handle with the passages in the working tip, said means including a valve assembly for controlling the amount of fluid delivered by the instrument, said valve assembly having at least a part of its length exposed for contact by the fingers of the operator and comprising:

i. a resilient tubular connector having an internal bore communicating at one end with the fluid supply passage in the handle and at the other end with the fluid delivering passage in the working tip,

ii. a diaphragm integral with and mounted across the bore of the connector; and

iii. a slit in the diaphragm having sides that normally abut each other to thereby close the bore but which spread apart and permit passage of fluid upon application of and deformation of the diaphragm by pressure from the operator's fingers.

3,889,676

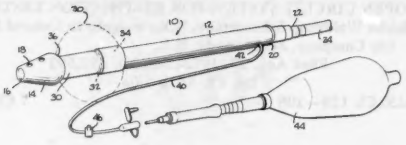
ENEMATA ADMINISTERING DEVICE

Franklin R. Greene, Flushing, N.Y., assignor to E-Z-EM Company Inc., Westbury, N.Y.

Filed Mar. 30, 1973, Ser. No. 346,614

Int. Cl. A61m *3/00*

U.S. Cl. 128—246 **4 Claims**



1. An enemata administering device comprising: a hollow stem having exit ports at a distal end thereof, an inlet at the proximal end thereof for receiving a fluid, a smooth expandable resilient cylindircal sleeve of substantially constant diameter and substantially constant wall thickness mounted on the exterior surface of said stem near said distal end of said stem, said sleeve being hermetically sealed to said stem at both ends of said sleeve, said sleeve having an unsealed section between said sealed ends, said ends of said sleeve being sealed to said stem a distance apart along said stem substantially less than the unsealed length of said sleeve when said sleeve is deflated, only the proximal end of said sleeve having a reentrant section to take up the resultant extra length of sleeve material, only a portion of said reentrant section being sealed to said stem, a substantial portion of said reentrant section being free to expand away from said stem, said sleeve conforming to said stem when deflated, and means for inflating said sleeve.

3,889,677

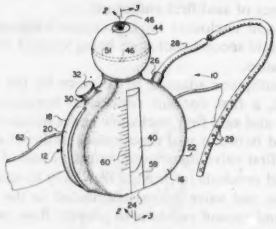
SELF-CONTAINED FLUID EVACUATOR

John R. Nehring, Woodcliff Lake, N.J., assignor to International Paper Company, New York, N.Y.

Filed Nov. 19, 1973, Ser. No. 417,124

Int. Cl. A61m *1/00*

U.S. Cl. 128—278 **22 Claims**



1. A self-contained fluid evacuator comprising a substantially rigid, closed container having first and second openings therethrough, said first opening being adapted to receive a conduit, an inflatable member within said container, means

for inflating said inflatable member mounted on said container and being in flow communication with the interior of said inflatable member through said second opening, valve means responsive to the difference in pressure between the pressure in the inflation means and in the inflatable member such that said valve means enables fluid to enter the inflatable member from the inflating means at a higher rate than the fluid can leave the inflatable member, said valve means restricting fluid from leaving the inflatable member at a rate greater than a predetermined minimal flow rate.

3,889,678

CELLULOSE GRAFT COPOLYMER CONTAINING NONONIC AND IONIC POLYMER MOIETIES AS ABSORBENT MEDIA IN ABSORBENT DRESSINGS

Pronoy Kumar Chatterjee, Spotswood, and Robert Frederick Schwenker, Jr., Belle Mead, both of N.J., assignors to Personal Products Company, Milltown, N.J.

Filed Dec. 7, 1973, Ser. No. 422,627
Int. Cl. A61f *13/16*
U.S. Cl. 128—284 **12 Claims**

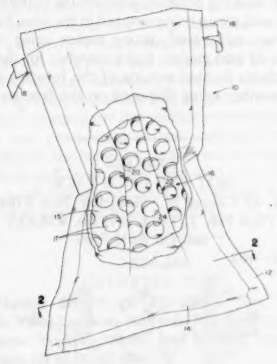
1. In an absorbent dressing for absorbing body fluids the improvement which comprises including therein as an absorbent media, cellulose graft copolymer in fibrous form having a backbone of cellulose and side chains of polymer moieties grafted thereto, said polymer moieties being selected from the class consisting of ionic and nonionic polymer moieties and constituting from about 10% to about 90% by weight of the total weight of the cellulose graft copolymer, some of said side chain polymer moieties being ionic polymer moieties and comprising from about 10% to about 80% by weight of the total weight of the cellulose graft copolymer, and the other of said side chain polymer moieties being nonionic polymer moieties and comprising from about 0.5% to about 60% by weight of the total weight of the cellulose graft copolymer.

3,889,679

DISPOSABLE DIAPER WITH HOLES OR WELLS

Glenn N. Taylor, Cary, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Feb. 4, 1974, Ser. No. 439,101
Int. Cl. A61f *5/44*
U.S. Cl. 128—287 **4 Claims**



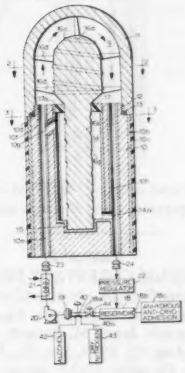
1. A disposable diaper comprising an absorbent body and a flexible water impervious backing sheet, said absorbent body comprising a continuous integral mass of fibers formed into a sheet having an inner surface and having an outer surface disposed adjacent said backing sheet, said absorbent body having a multiplicity of openings therein extending therethrough defining fluid passages from said inner surface to said outer surface, whereby fluid may flow from said inner to said outer surface through said openings, said absorbent body being free of the backing sheet throughout a sufficient area intermediate the openings to permit unimpeded flow of fluid along a surface of the backing sheet to regions of the absorbent body remote the openings and absorption therein.

3,889,680

CRYOADHESION PREVENTING CRYOSURGICAL INSTRUMENTS

Thomas Anthony Armao, 1242 56th St., Brooklyn, N.Y. 11219

Filed Feb. 7, 1974, Ser. No. 440,539
Int. Cl.² A61B *17/36*
U.S. Cl. 128—303.1 **16 Claims**



1. A cryosurgical instrument comprising a body of heat insulating material, a hollow sheath comprised of a good heat conducting material at least a portion of which is porous, said sheath being on one end of said body, a core of good heat conducting material projecting into said sheath from within said body having the outer surface thereof spaced from the inner surface of said sheath so as to leave a space between said core and said sheath, said body having an inlet passage therethrough opening into said space, said body having an outlet passage therethrough opening out of said space, said body having a heat exchange space along the portion of said core within said body and means for directing a flow of heat exchange fluid therethrough for exchanging heat between said core and fluid flowing in said heat exchange space, and means for supplying a heat exchange fluid to said heat exchange space.

3,889,681

CRYOSURGICAL SPRAYING APPARATUS

Jack Douglas Waller, Box 502, Sunray, Tex. 79086; Bobby Lee Limmer, 4231 Bloomdale, San Antonio, Tex. 78218, and Felix M. Sandlin, 420 Tower Dr., San Antonio, Tex. 78232

Filed Oct. 30, 1974, Ser. No. 519,245
Int. Cl.² A61B *17/36*
U.S. Cl. 128—303.1 **6 Claims**

1. A cryosurgical instrument for treating skin lesions comprising:

an insulated container for holding a liquefied gas coolant;

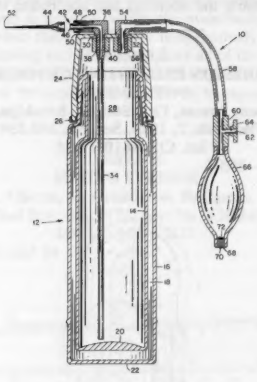
cap means for said insulated container;

a combination vent/pressure line communicating with the inside of said insulated container;

tubing means extending from near the bottom of said insulated container to the outside thereof;

nozzle means attached to said tubing means for spraying said liquefied gas coolant upon pressurization from said vent/pressure line;

said vent/pressure line being connected to atmosphere through a first opening and to a source of pressurized air



through a second opening, said first opening being covered before pressurization through said second opening.

3,889,682

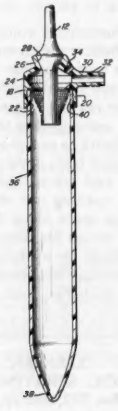
VACUUM CURETTAGE DEVICE

Roger Denis, 4 Shore Park Dr., Newport News, Va. 23602, and Jewell M. Barnett, Newport News, Va., assignors to said Roger Denis, by said Jewell M. Barnett

Filed Aug. 17, 1973, Ser. No. 389,189

Int. Cl. A61b *17/22*; **A61m** *1/00*

U.S. Cl. 128—304 **9 Claims**



1. A vacuum curettage device comprising a curette including an elongated tubular shank having an outer tip inlet at one end and a discharge end portion at its other end, a hollow fitting having first and second opposite sides, the discharge end portion of said shank being supported from and projecting through said first side of said fitting into the latter, said second side of said fitting having a combined inlet and outlet opening formed therein with which said discharge end portion is at least generally aligned, said fitting including a vacuum air flow outlet opening adapted to be communicated with a suitable source of vacuum, a reservoir removably supported from said fitting in communication with and closing said combined inlet and outlet opening, and a filter assembly including an outer periphery sealed relative to said combined inlet and outlet opening and a central opening formed therethrough with which said discharge end portion is registered and engaged in at least reasonably good sealed engagement therewith.

3,889,683

SURGICAL APPARATUS FOR SUTURING SOFT TISSUES

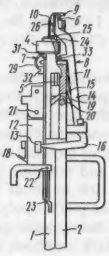
Nikolai Nikolaevich Kapitanov, ulitsa Oktyabrskogo Polya, 5, kv. 9; Natalya Petrovna Petrova, 1 Novokuzunskaya ulitsa, 4, kv. 40; Oleg Borisovich Milonov, Leninsky prospekt, 93, korpus 4, kv. 44, and Anatoly Alexandrovich Dyachikhin, Polyarnaya ulitsa, 54, korpus 1, kv. 38, all of, Moscow, U.S.S.R.

Filed May 20, 1974, Ser. No. 471,687

Claims priority, application U.S.S.R., Sept. 28, 1973, 1974605

Int. Cl. A61b *17/32, 17/04*

U.S. Cl. 128—305 **5 Claims**



1. A surgical apparatus for suturing soft tissues, comprising: two guides interhinged at one end; a tie spring between the guides which normally maintains the guides at the other end in a spaced-apart position; a magazine for storing a plurality of U-shaped suturing staples therein disposed at the free end of one of the guides; a pusher adapted to slide along said latter guide for ejecting the staples from said magazine points first; twin needleshaped dies disposed on the free ends of said guides for seizing therebetween, as the guides are brought together, the tissue to be staple-sutured; a means for controlling said magazine by displacing the magazine and feeding new staples to the working position; a means for cutting the vessels and ducts of said tissue being sutured in the area between said applied staples, said vessel-cutting means being disposed on the free ends of said guides; and a member for detaching the vessels and ducts located outside of the suturing and cutting zone, said member being disposed on the free end of one of the guides.

3,889,684

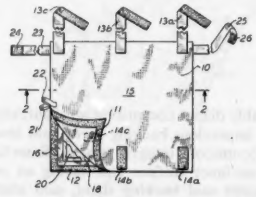
HOT AND COLD PACK

Steve Lebold, 45 Church St., Montclair, N.J. 07042

Filed Feb. 1, 1974, Ser. No. 438,633

Int. Cl. A61f *7/00*

U.S. Cl. 128—402 **7 Claims**



1. A pack for therapeutic heat transfer with portions of the human body which comprises a substantially fluid impervious envelope, heat transfer means enclosed therein and a porous

flexible cover therefor surrounding said envelope, said cover comprising

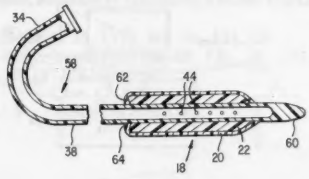
a flat sheet member folded along a fold line to provide a pair of superimposed members, said members being detachably fastened along the edges thereof beyond the fold line to permit ready insertion and removal of the pouch, and a plurality of flexible strap means attached to said cover member having detachable fastening means at the end of each and cooperating fastening members attached to the body of the cover at points remote from said strap members to permit attachment of the heat exchange assembly to a body member.

3,889,685

TUBULAR UNIT WITH VESSEL ENGAGING CUFF STRUCTURE

George E. Miller, Jr., Sacramento; Paul Kahn, San Francisco, and William C. Dabney, Oakland, all of Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.

Filed Nov. 2, 1973, Ser. No. 412,355
Int. Cl. A61m *25/00*
U.S. Cl. 128—348 **7 Claims**



1. A tubular unit with vessel engaging cuff structure for use within liquid conveying vessels of the body comprising a tube having an open end and a closed end, a compressible cuff surrounding said tube and mounted on said tube adjacent the closed end thereof, the tube being completely closed between said closed end thereof and a front wall of said cuff to preclude liquid from passing from said vessel into said tube and fluid from passing from said tube into said vessel, said cuff including a resilient, reticulated filler material having a network of fluid receiving interstices and a vessel engaging, flexible outer surface layer enclosing said filler material that is formed of a material which is impervious to liquids and gasses, the cuff also having a front wall adjacent the closed end of said tube which is inclined outwardly from said tube away from the closed end thereof, and a rear wall spaced from said front wall and having a substantially flat surface extending laterally from said tube, and conducting means communicating with said filler material to facilitate the withdrawal of fluid therefrom to contract said cuff inwardly toward said tube from a normal expanded configuration assumed by said cuff when said fluid receiving interstices are filled with fluid.

3,889,686

CATHETER TUBE

Stanley Francis Duturbure, Wentworthville, Australia, assignor to Vicki Lorraine Hoswell, Parramatta; Michael Roy Duturbure, Wentworthville and Ronda Lynne Walker, Blacktown, all of, Australia

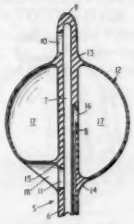
Filed June 26, 1973, Ser. No. 373,729
Claims priority, application Australia, July 4, 1972, 44209/72
Int. Cl. A61m *25/00*
U.S. Cl. 128—349 B **2 Claims**

1. Catheter means comprising an extended flexible tube, said tube housing first and second longitudinal bore means, said first bore means extending for substantially the entire length of the catheter and terminating adjacent the leading end of the tube;

first and second aperture means in the tube communicating with said first bore means;

said first aperture means being located adjacent the leading end of said tube and said second aperture means being spaced from said first aperture means towards the following end of said tube;

thin tubular membrane means positioned around said tube substantially in the region of the tube between said first and said second aperture means and being affixed to an entirely surrounding said tube so that a junction between said membrane and said tube is not above said second aperture means except in the immediate area thereof where said junction is above said second aperture means; said second bore means extending substantially throughout the length of said catheter;



further aperture means in said tube interconnecting said second bore means and the space between said tube and said thin tubular membrane means; and

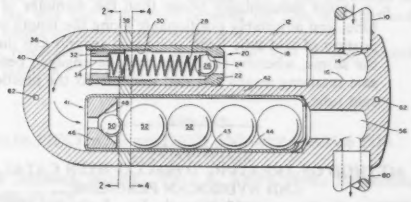
port means, through which waste matter may pass from a bladder into which that part of the catheter containing said first and said second aperture means is inserted through said second aperture means and into said first bore means, said port means positioned within the area around said second aperture at the said junctions of the membrane and tube and being formed in said thin tubular membrane means when the space between said thin tubular membrane means and said flexible tube is ballooned by the introduction of fluid into said space.

3,889,687

SHUNT SYSTEM FOR THE TRANSPORT OF CEREBROSPINAL FLUID

Donald L. Harris, 780 S. Shore Dr., Miami Beach, Fla. 33141, and Salomon Hakim, Carrera 13, N. 48-26,, Bogota, Colombia

Filed Jan. 31, 1974, Ser. No. 438,217
Int. Cl. A61m *27/00*
U.S. Cl. 128—350 V **5 Claims**



1. A shunt system for transporting cerebrospinal fluid from a source of such fluid within the body to a selected site within the body, comprising tubing for connection to the source of fluid, a pressure-operated check valve connected to said tubing, a second valve connected in series to the check valve, separate means connected with said second valve and responsive to the force of gravity for causing said second valve to open at a higher pressure when the valve is substantially verti-

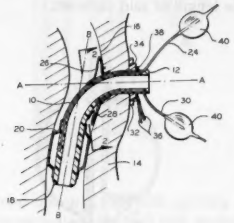
cal and permitting the valve to open freely when the valve is substantially horizontal, and tubing connected in series with said second valve for connection to a site in the body to which the fluid is to be transported.

3,889,688

TRACHEOSTOMY TUBE WITH NOVEL RETAINING MEANS

Precha Eamkaow, 106 Revere Rd., Dewitt, N.Y. 13214

Filed Dec. 19, 1973, Ser. No. 426,045
Int. Cl. A61m *16/00*
U.S. Cl. 128—351 **8 Claims**



1. A tube device for introduction into the trachea to form an artificial airway through a patient's throat, said device comprising, in combination:

a. a hollow tube having open ends and a bend intermediate of said ends to form portions lying along first and second linear, intersecting axes, said tube being constructed and arranged for insertion of one end thereof through a tracheal stoma and into the tracheal lumen with said first axis disposed generally coaxial with the tracheal lumen and said second axis extending through the stoma;

b. impermeable means attached to the portion of said tube lying along said first axis and inflatable from a retracted to an extended position to effect a seal between, said tube and lumen;

c. inflatable retaining means attached to the portion of said tube lying along said second axis closely adjacent said bend, and movable with respect thereto between retracted and extended positions, said tube and retaining means having a combined dimension laterally of said second axis when retracted allowing insertion of said tube and retaining means through the stoma, and a combined dimension laterally of said second axis when extended preventing withdrawal of said tube through the stoma;

d. means for selectively inflating said impermeable means and said retaining means between said retracted and extended positions while inside the patient's trachea; and

e. a shield substantially wider than the diameter of said tube, and adjustably positionable along the length of the portion of said tube lying along said second axis outside the stoma, whereby the tissue may be engaged between said retaining means and said shield to fix the position of said tube.

3,889,689

METHOD OF TREATING TOBACCO WITH CATALASE AND HYDROGEN PEROXIDE

William E. Rosen, 2055 Wisteria Ln., Lafayette Hills, Pa. 19444, assignor to Rosen Enterprise, Inc., Lafayette Hills, Pa.

Continuation-in-part of Ser. No. 198,662, Dec. 20, 1971, abandoned. This application Aug. 11, 1972, Ser. No. 279,857
Int. Cl. A24b *03/18, 15/06*
U.S. Cl. 131—140 P **13 Claims**

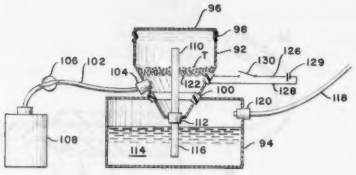
1. A method of treating tobacco to improve its flavor and expand the tobacco, comprising the steps of substantially evenly distributing on the surface of the tobacco catalase and a liquid solution containing hydrogen peroxide, the amounts of catalase and hydrogen peroxide being sufficient to mutually decompose each other, and before significant reaction between these two components obtaining, applying physical force in the form of pressure means selected from the group comprising roller means, flat pressure means, and continuous expression means to said tobacco to cause catalase ahd hydrogen peroxide to permeate the interstices of the tobacco, whereby the catalase and hydrogen peroxide react in situ on and within the tobacco.

3,889,690

SMOKING APPLIANCE

James Guarnieri, 4809 Blackfoot Rd., College Park, Md. 20740

Filed Sept. 24, 1973, Ser. No. 400,167
Int. Cl. A24f *47/00, 1/30*
U.S. Cl. 131—185 **1 Claim**



1. A smoking appliance comprising:

a. receptacle means having a fluid passageway therein,

b. a gas permeable screen mounted within said receptacle means and positioned across said passageway,

c. said screen being adapted to support a quantity of lighted tobacco, and

d. a heat generating, electrically resistive wire woven into said screen.

3,889,691

TOBACCO SMOKE FILTER

John Emery Urbanic, Pittsburgh, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Dec. 21, 1973, Ser. No. 427,201
Int. Cl. A24b *15/02*
U.S. Cl. 131—267 **5 Claims**

1. The method of removing HCN from tobacco smoke which comprises contacting said tobacco smoke with a tobacco smoke filtering material comprising at least about 50 milligrams of granular activated carbon impregnated with 0.5 to 15 percent by weight of cuprous chloride.

3,889,692

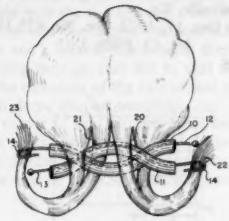
HAIR DRESSING METHOD AND DEVICE

Allan Raymond Redrow, 4990 Columbus Pike, Apt. 416, Arlington, Va. 22204

Filed Oct. 16, 1974, Ser. No. 515,150
Int. Cl.[2] A45D *7/00*
U.S. Cl. 132—7 **18 Claims**

1. A method for arranging long hair on the head of a person into an intertwined pattern comprising separating that portion of the hair to be intertwined into individual strands that are attached to the head at one end with the other end of each

strand being free, delivering the separate strands through individual and intertwined guides to intertwine the strands,



and removing the guides from the strands to leave the hair strands intertwined.

3,889,693

ELECTRIC HAIR DRYER WITH SPRAY

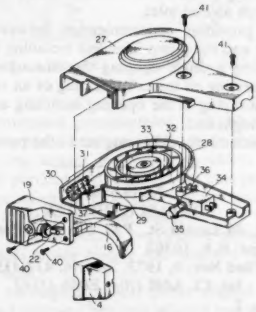
Hisayuki Tanaka; Yukio Wada, and Seiichro Shiba, all of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Japan

Filed Feb. 16, 1973, Ser. No. 333,320

Claims priority, application Japan, Feb. 19, 1972, 47-20694; Feb. 19, 1972, 47-20695

Int. Cl. A45d *1/00*

U.S. Cl. 132—9 **1 Claim**



1. An electric hair dryer apparatus comprising:

a dryer unit including a pistol shaped body having a barrel portion and a handle portion disposed at an angle to said barrel portion, said body consisting of two half members that are separable from each other along a longitudinal plane of said body, said body having an air inlet and a hot-air outlet with said hot-air outlet being at the end of said barrel, an air blowing fan and a motor for driving said fan both contained within said body, an electric heater means mounted adjacent said hot-air outlet, trigger means on said handle portion for operating said fan motor and heater to effect the discharge of hot air from said outlet,

a spray unit having a pistol like configuration, said spray unit including a fluid reservoir tank, pump means and a spray nozzle disposed above said tank and respectively forming a barrel portion of said configuration, lever means for operating said pump means to cause fluid in the tank to be discharged from said nozzle and forming a handle portion of said configuration,

a mouthpiece removably coupling the barrel portions of said spray and dryer units with the barrel and handle portions of said spray unit in closely adjacent relation to the respective barrel and handle portions of said dryer unit, said spray unit lever means being located immediately adjacent said dryer unit trigger means, said lever means and trigger means being on a common side of said dryer unit handle portion, said sprayer unit nozzle and dryer unit outlet causing fluid spray and hot air respectively to be emitted from said apparatus in a common direction, and

said dryer unit body being formed with a pawl for resiliently engaging and supporting said reservoir tank in operative relation below said spray unit nozzle and pump means, and said tank being selectively removeable from said spray unit without uncoupling said dryer unit and said spray unit from said mouthpiece.

3,889,694

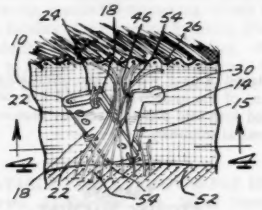
MEANS AND METHOD FOR ATTACHING A HAIR PIECE TO THE HAIR

David L. Greer, 1168 Virginia, St. Paul, Minn. 55117

Filed Aug. 14, 1974, Ser. No. 497,195

Int. Cl. A41g *3/00*

U.S. Cl. 132—53 **8 Claims**



1. A hair piece clip for attaching a hair piece to natural living hair growing on a head;

A. said clip including:

1. a generally flat, U-shaped base including a pair of flat, generally parallel, spaced apart, resilient side walls and an edge wall fixedly positioning the side walls with respect to each other, and
2. an arm pivotally mounted between said side walls at a first inner end portion of said arm, said arm being movable between a first open position wherein most of said arm is out from between said side walls and a second closed position wherein said arm is substantially entirely between said walls;

B. means for attaching said base of said clip to a hair piece;

C. the relationship of the width of the arm to the distance between said side walls being such that when said arm is moved from said first to said second position with natural living hair bridging the space between said side walls in the path of said arm, the natural hair is carried ahead of the arm and is trapped between the arm and opposed facing surfaces of said walls; and

D. releasable means for holding said arm in said second position.

3,889,695

HAIR PIECE AND METHOD AND APPARATUS FOR MAKING SAME

Peter Anthony Incando, 8907 E. Valley Blvd., Rosemead, Calif. 91770

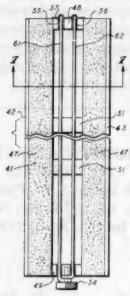
Filed Aug. 27, 1973, Ser. No. 392,038

Int. Cl. A41g *3/00*

U.S. Cl. 132—53 **2 Claims**

1. A hair piece for attachment to the scalp of a user and comprising a base having a plurality of polyvinylchloride plastic layers, a concave undersurface on the base, and nylon mesh cloth layers; a nylon anchor net and a multiplicity of strands of hair fixed to the anchor net, said anchor net and base being joined by the final plastic layer of the base; some of said hair strands being looped through the anchor net; and

some of said strands of hair being hair wefts each comprising a plurality of hair strands, a plasticized anchor band chemically co-soluble with the plastic layers of the base and securing



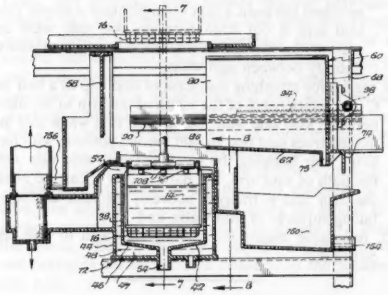
each hair strand of each weft in like orientation with respect to the extent of the anchor band, said hair wefts being solventally united with said plastic layers by reason of their compatible chemical solubility.

3,889,696

ETCHING MACHINE

David L. Ousterling, Mountain Lakes, and Harold F. Jones, Dover, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Apr. 29, 1974, Ser. No. 465,441
Int. Cl. B08b *3/02*
U.S. Cl. 134—57 R **12 Claims**



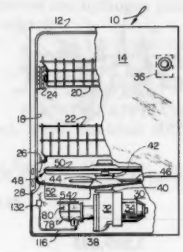
1. In an apparatus for processing an article comprising a carrier for the article, means for moving the carrier and article downwardly into a bath containing a first liquid, means for lifting the carrier and article upwardly from the bath, a spray chamber separate from the bath and means for spraying the article on the carrier with a second liquid when the carrier and article are in the spray chamber; the improvement comprising a spray chamber having a movable portion and means for moving the movable portion to position the spray chamber around the carrier and article and between the article and the bath after the carrier and article are lifted upwardly from the bath by the lifting means.

3,889,697

AERATION DRAIN PLUG FOR DISHWASHERS

Lauren W. Guth, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 17, 1973, Ser. No. 425,197
Int. Cl. B08b *3/02*
U.S. Cl. 134—95 **9 Claims**



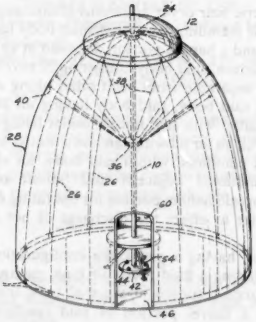
1. A dishwasher comprising
a tub and a movable door providing together a wash chamber;
a rack and means mounting the rack for movement into and at least partially out of the wash chamber;
means for spraying aerated washing liquid toward the rack including
a spray mechanism in the wash chamber,
a pump having an outlet in communication with the spray mechanism and an inlet,
a conduit providing communication between the wash chamber and the pump inlet and including a closed side wall having a single opening therethrough for alternatively receiving an imperforate plug or an aeration plug; an aeration plug in the opening including an air passage therethrough; and
means for selectively delivering air to the passage.

3,889,698

PORTABLE SHELTER

Julius Roessl, 40 Larkin St., P.O. Box 433, Port Richmond, Staten Island, N.Y. 10302

Filed Nov. 9, 1973, Ser. No. 414,419
Int. Cl. A45f *1/04;* **E04b** *1/347*
U.S. Cl. 135—2 **3 Claims**



1. A portable shelter comprising a center pole, said center pole being provided with a slot extending along its length, a circular header fixed to said center pole, a plurality of outer ribs hingeably extending from said circular header, a first collar slidably movable along said center pole below said circular header, a plurality of expansion ribs hingeably extending from said collar, the other end of each of said expansion

ribs being connected to a different one of said outer ribs, a pliant covering over said outer ribs and connected to the ends of said outer ribs; a dome-shaped ventilator cap, a second slidable collar connecting said dome-shaped ventilator cap to said center pole near the top thereof, a rod within said center pole having one end connected via said slot to said second slidable collar and a second end remote therefrom having an extension passing through said slot so that movement of said extension in the direction of the axis of said center pole raises or lowers said dome-shaped ventilator cap; a circular floor, means at the center of said circular floor for supporting said center pole in an upright position, and means disposed along the periphery of said circular floor for engaging the ends of said outer ribs remote from said circular header.

3,889,699

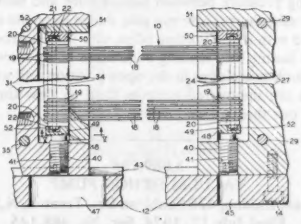
SELF-CONTAINED MULTI-BLADE PACKAGE AND ASSEMBLY UTILIZING SAME

Louis F. Ranieri, 8423 N. Clifton St., Niles, Ill. 60648

Continuation-in-part of Ser. No. 79,947, Oct. 12, 1970, Pat. No. 3,742,805. This application July 2, 1973, Ser. No. 375,389

Int. Cl.[2] B28D *1/06*

U.S. Cl. 125—16 R **5 Claims**



1. A self-contained, preassembled, multi-blade package for mounting in a blade head assembly of an existing wafering machine having square tensioning shoulders and wherein opposite end portions of the blades are clamped under pressure between clamping blocks for unison tensioning of the blades by said shoulders, comprising:

a plurality of substantially coextensive elongated thin flat strip blades in side-by-side assembly and having opposite end portions;

elongated rectangular spacer plates aligned with one another and disposed between aligned end portions of the blades, and having small diameter aligned holes;

elongated rectangular end plates generally coextensive with and aligned with the spacer plates at the opposite sides of the blade package and having aligned holes aligned with the holes of the spacer plates;

said spacer plates and said end plates having their longitudinal edges transverse to the longitudinal edges of the blades and extending substantially beyond the opposite planes across the edges of the blades and thereby providing square shoulders along the combined edges of the plates which face away from the adjacent ends of the blades for engagement with the square tensioning shoulders of the blade head assembly;

connecting rods extending through the aligned holes of the spacer plates and end plates;

means on the respective opposite end portions of said rods retaining the spacer plates and end plates and blades assembled with the rods so that the blade package can be handled as a self-contained unit for mounting in and removal from the blade head assembly;

said clamping blocks at each opposite side of the blade package being of elongated rectangular shape generally coextensive with and matching the size of the spacer plates and end plates, the blocks having a longitudinal axis transverse to the edges of the blades and extending substantially beyond the opposite planes across the edges of the blades the same as said spacer plates and end plates and providing square shoulders in the plane of the plate shoulders and facing away from the adjacent ends of the blades, the clamping blocks having in their faces which engage the end plates recesses just large enough to receive ends of the connecting rods and said retaining means freely and with opposite faces of the clamping blocks being unbroken to receive full thrust of the ends of compression screws of the head assembly thereagainst; and said rods and said holes in the plates and said recesses in said blocks being eccentric to the plates and blocks and being located in substantial eccentric offset clearance relation with respect to maximum available unobstructed solid frictional compression thrust areas in the aligned portions of the blades and plates and clamping blocks all the way across the blade package at each of said end portions, and which areas extend throughout the widths of the blades and extend from the shoulder edges of the plates and blocks throughout at least one half the width of the plates and blocks, for receiving maximum frictional clamping thrust value from blade head assembly compression screws driven against the clamping blocks;

whereby to enable maximum tensioning of the blades with freedom from liability of slipping and breaking of any blade in the package during said maximum tensioning, while permitting said rods to remain continuously in place in the package to maintain the benefit of the rod connection for handling of the package.

3,889,700

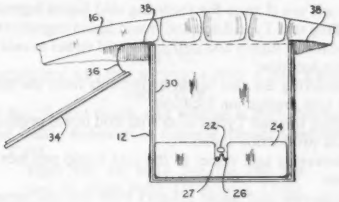
SELF-INFLATABLE POCKET DISPOSABLE UMBRELLA

Joseph F. Kirley, 27 Fairfield Ave., South Norwalk, Conn. 06854

Filed Feb. 20, 1973, Ser. No. 333,479

Int. Cl. A45b *19/02, 15/00*

U.S. Cl. 135—19.5 **1 Claim**

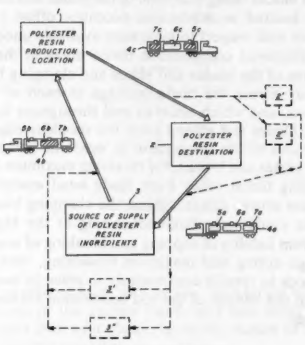


1. A single-use, self-inflatable, disposable, pocket-size umbrella comprising a carrying case provided with a non-slip external gripping surface, said carrying case having a length of approximately 4 inches, a cover for said carrying case capable of being removed therefrom but remaining connected thereto, an umbrella part having interconnected inflatable rib channels, a pressure vessel provided with a frangible part, a propellant in said pressure vessel, the bottom of said case being provided with an internal projection for selectively rupturing said frangible part of the pressure vessel when said carrying case is squeezed whereby said propellant inflates said inflatable rib channels to open the umbrella, said carrying case being the handle for the umbrella, said connection between said carrying case and cover being a tab interconnection between said cover and at least one of said inflatable rib channels whereby when the tab is pulled in a predetermined direction said channel is opened and the pressurized gas in said rib channels escapes to the atmosphere permitting the umbrella to collapse to a compact form for ready disposal.

3,889,701
HIGHWAY TANKER WAGON AND METHOD OF MAKING AND DELIVERING LIQUID PRODUCTS

Noel J. Mueller, Box 28, Waubeka Village, Fredonia, Wis. 53021

Continuation of Ser. No. 71,462, Sept. 11, 1970, abandoned. This application Apr. 1, 1974, Ser. No. 456,675
Int. Cl.[2] B60P 3/24
U.S. Cl. 137—1 7 Claims



1. The method of producing and delivering liquid products which are prepared from liquid ingredients,
1. establishing a liquid product production location;
2. establishing a source of supply for said liquid ingredients;
3. establishing a liquid product destination;
4. establishing within a multiple-zone tanker vessel
   a. a Type I zone for receiving said liquid products; and
   b. a Type II zone for receiving said liquid ingredients;
5. filling said Type II zone with said liquid ingredients at said source of supply and delivering said vessel to said production location;
6. removing the said liquid ingredients from the said vessel at said production location;
7. filling the said Type I zone with said liquid product, at the said production location;
8. delivering said vessel to the said liquid product destination;
9. removing said liquid product from the said vessel at the said liquid product destination;
10. transporting said vessel with both said Type I zone and said Type II zone substantially empty to said supply source;

and
11. repeating steps 5 through 11 in sequence.

3,889,702
PROCESS FOR REDUCING FRICTION LOSS IN FLOWING ORGANIC FLUIDS

Allan P. Evans, Annapolis, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

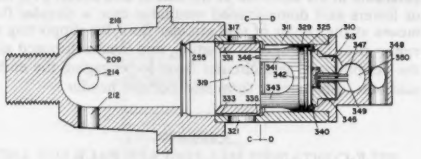
Filed Jan. 23, 1974, Ser. No. 435,809
Int. Cl. F17d 1/16
U.S. Cl. 137—13 5 Claims

1. A method of reducing frictional drag of organic liquids in turbulent flow through conduits comprising:
adding a quantity of a dipole-dipole polymer, comprising a pentacoordinate trigonal bipyramid compound of group IV metals of the Periodic Table, to the organic liquid.

3,889,703
SLEEVE VALVE ARRANGEMENT

Donald P. Keathley, Middletown, Conn., assignor to ICI United States Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 229,473, Feb. 25, 1973, abandoned. This application Mar. 5, 1973, Ser. No. 337,943
Int. Cl. B60r 21/08
U.S. Cl. 137—67 8 Claims

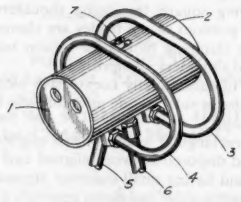


1. In a sleeve valve for containing fluid under pressure comprising a shell having a plurality of ports therein, a closure across said shell, a hollow sleeve slidable in said shell into separate positions in which said ports are covered and uncovered, a piston in said shell separable from said sleeve and positioned between said sleeve and said closure, and means for exerting pressure between said closure and said piston so as to slide said sleeve, wherein said sleeve opposite said piston is provided with a thin leading edge, said shell is provided with means for flaring said leading edge upon being moved by said piston to lock said sleeve in the open position and which when said ports are uncovered permits fluid to flow through said ports and out through said sleeve.

3,889,704
VACUUM SIPHON PUMP

Vito Michael Rubino, 420 Sanhican Dr., Trenton, N.J. 08618

Filed July 12, 1974, Ser. No. 488,145
Int. Cl.[2] F04B 10/00; F16L 43/00
U.S. Cl. 137—123 3 Claims



1. A siphon comprising an elongated suction pipe adapted to be inserted in a supply of liquid, valve means connected to the uppermost portion of said suction pipe, an elongated discharge pipe, said valve means connected to said discharge pipe at its uppermost portion and establishing a path of communication between said suction pipe and said discharge pipe, the lowermost portion of said discharge pipe extending to a lower level than the lowermost portion of said suction pipe; said valve means including a valve housing and a valve plunger, said housing having proximal, middle and distal pairs of holes in a lower wall thereof, said proximal pair of holes being connected externally of the housing to each other by first conduit means, said distal pair of holes being connected to each other externally of the housing by second conduit means, one of said middle pair of holes being connected to said suction pipe, the other of said middle holes being connected to said discharge pipe, said housing having first and second open ends;
said plunger having proximal and distal pairs of bores in a lower portion thereof, each of said proximal bores communicating with corresponding distal bores via path means in the plunger,

means to reciprocate said plunger between a first and second position;

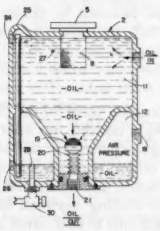
in said first position said proximal holes communicating with said proximal bores, said middle holes communicating with said distal bores and said distal holes communicating with said second open end, whereby some fluid in said second conduit flows through said second open end; in said second position said proximal holes communicating with said first open end whereby some fluid in said first conduit flows through first open end, said middle holes communicating with said proximal bores, and said distal holes communicating with said distal bores.

3,889,705

HYDRAULIC SYSTEM RESERVOIR HAVING SEPARATE OIL AND AIR-OIL CHAMBERS

Curtis M. Coderre, Torrance, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Aug. 30, 1973, Ser. No. 393,219
Int. Cl. F16l *55/04*
U.S. Cl. 137—171 **6 Claims**



1. A reservoir for use in a closed loop aircraft hydraulic system wherein liquid is drawn from the reservoir and returned thereto for storage and re-use, comprising:

a. a shell having a pair of opposite end walls with a side wall therebetween, one of said end walls being at the top of said reservoir and the other end wall at the bottom when said reservoir is used in an aircraft in normal level flight;

b. baffle means extending from an intermediate region of said side wall to an intermediate region of said other end wall for dividing said shell into a main oil chamber for oil storage and re-use and an air-oil chamber for air collection and make-up oil;

c. said main oil chamber having an oil outlet adjacent to said other end wall and having an oil inlet remote from said outlet, said outlet having hollow expansible bellows means extending therefrom into said main oil chamber toward said one end wall, with a free end provided with a perforated head having sufficient weight to expand said bellows means when said reservoir is rotated toward an inverted position;

d. said air-oil chamber having an air pressurization inlet;

e. and a transfer tube interconnecting said chambers and having opposite ends adjacent to said end walls, respectively.

3,889,706

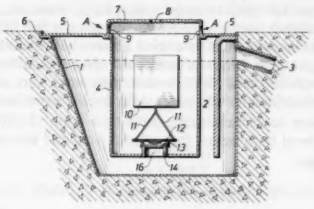
FLOAT-CONTROLLED VALVE

Jan Olof Wilhelm Wallin, Taby, Sweden, assignor to PX Petrocontrol AB, Taby, Sweden

Filed Jan. 23, 1974, Ser. No. 435,966
Claims priority, application Sweden, Feb. 21, 1973, 7324432
Int. Cl. F16k *31/24*
U.S. Cl. 137—172 **5 Claims**

1. In a float-controlled valve for separating a liquid, such as water, from at least one other liquid, such as oil, having a lower density than the first-mentioned liquid, wherein the valve is disposed in the lower part of a generally closed housing means, such as a tank, the valve including a valve member connected to a float the density and size of which are adapted so as to cause the valve member to open a discharge opening of the valve when the float is buoyantly supported at least partially by the heavier liquid, but to cause the valve member to close the discharge opening in other cases, the improvement wherein:

said discharge opening being defined between an outer, substantially circumferential seat face defining therein a space and an inner support plate which is positioned in said space and which is coaxially fixedly mounted with respect to said outer seat face, the outer periphery of said



inner support plate extending radially to a position adjacent said outer seat face to form therebetween a generally continuous circumferential passage;

said valve member comprising a diaphragm made of a flexible material and being supported on said support plate, said diaphragm, when the valve is in the closed position, sealingly engaging with said outer seat face; and

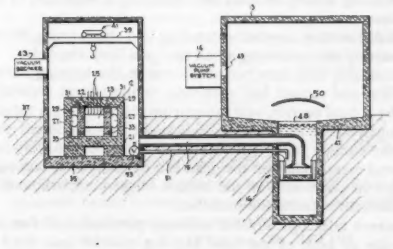
connecting means linking said float with said diaphragm at a circumferential portion thereof, such as at least one circumferential point or line thereof, for disengaging at least a portion of the circumferential part of said diaphragm from said outer seat face to open said valve when said float is buoyantly supported at least partially by the heavier liquid.

3,889,707

PRESSURE RELIEF SYSTEM FOR A NUCLEAR REACTOR

H. Peter Fay, Solana Beach, and William S. Peck, North Shore, both of Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Nov. 19, 1971, Ser. No. 200,318
Int. Cl. F16k *9/00*; **G21c** *9/00, 13/02*
U.S. Cl. 137—251 **6 Claims**



1. A pressure relief and containment system for a potential source of contaminated gas, comprising, a first containment enclosure for enclosing the potential source for receiving gas from the source, a second containment enclosure, means for producing a subatmospheric pressure in said second contain-

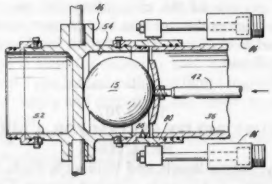
ment enclosure, duct means for conveying gas from said first containment enclosure to said second containment enclosure, and a pressure regulating fluid seal in said duct means for maintaining a separation between said first containment enclosure and said second containment enclosure, said fluid seal being breachable upon a rise in pressure within said first containment enclosure to a predetermined level to allow gas flow from said first containment enclosure into said second containment enclosure, said fluid seal including a main chamber in communication with said second containment enclosure, a second chamber, an overflow chamber, a wall separating said main chamber from said second chamber, a passage in said wall communicating between said main chamber and said second chamber, a weir between said second chamber and said overflow chamber and above the level of said passage, means for maintaining atmospheric pressure in said second chamber above said weir, and means for filling said main chamber with fluid to a level above that of said weir to provide a pressure head sufficient to offset the difference in pressure between said first containment enclosure and said second containment enclosure, said duct means being of a configuration to communicate with said main chamber at a discharge level both below that of said weir and above that of said passage.

3,889,708

DUAL BALL LAUNCH VALVE

Clyde H. Chronister; Cecil C. Grieger, and Alton D. Oliver, all of Houston, Tex., assignors to Chronister Development, Inc., Houston, Tex.

Filed May 17, 1974, Ser. No. 470,789
Int. Cl. F16k *25/00*
U.S. Cl. 137—268 **7 Claims**



1. A dual ball launch valve for launching and receiving a ball in a line comprising,

a housing having an inlet and outlet for connection to the line,

a ball insertion conduit extending into the housing for inserting and removing a ball into and from the valve,

a rotatable ball launcher positioned in the housing having first and second ball receiving compartments separated by a fluid barrier, said compartments including a tubular open end positioned to be brought into alignment with the conduit, inlet and outlet on rotation of the launcher, seal means adjacent the open end of each of the compartments positioned on the outside of the compartments,

means for rotating the launcher,

a sleeve telescopically and sealingly positioned on the outside of each of the inlet and the conduit and sized to telescopically engage the exterior of the open ends of said compartments and said seal means when a compartment is aligned with a sleeve, and

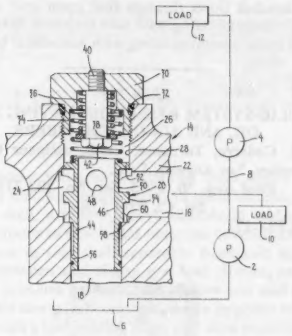
means operable from outside the housing for extending and retracting said sleeves into a telescopic engagement with the seal means on the tubular compartments of the launcher.

3,889,709

HYDRAULIC UNLOADING VALVE

Robert M. Dwyer, Livonia, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.

Continuation of Ser. No. 296,415, Oct. 10, 1972, abandoned. This application Mar. 25, 1974, Ser. No. 454,360
Int. Cl. F16k *31/12*
U.S. Cl. 137—504 **5 Claims**



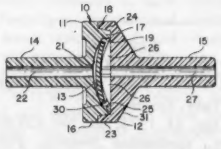
1. A hydraulic unloading valve for the diversion of hydraulic fluid flow comprising a housing; an inlet in said housing, an outlet in said housing; a chamber in said housing connected to said inlet and said outlet; a recess on opposite side of said chamber from said outlet, a member being slideably mounted in said chamber for shifting between an open position for passing fluid from said inlet to said outlet and a closed position for blocking fluid flow; means for urging said member to the open position, characterized by said member having a resultant force creating means including orifice means for automatically moving said member to the closed position over a range of viscosities of the fluid, said member having a first continuous sealing means with said recess, a second continuous sealing means with said outlet and a third sealing means between said first and second sealing means, said orifice means is between said first and third sealing means to receive fluid in the open position and to be isolated from said inlet in said closed position, said third sealing means in a non-sealing relation in said open position and in sealing relation with the recess to block flow through said orifice means thereby preventing flow of fluid through the valve.

3,889,710

CHECK VALVE WITH ELASTOMERIC VALVE ELEMENT

Julien H. Brost, 56 Sauganash Dr., Fontana, Wis. 53125

Continuation of Ser. No. 307,352, Nov. 7, 1972, abandoned. This application Jan. 11, 1974, Ser. No. 432,610
Int. Cl. F16k *15/00*
U.S. Cl. 137—512.15 **21 Claims**



1. A check valve comprising:

a housing defining a chamber having first and second opposing ends,

an inlet passage having an opening entering the chamber through one of said opposing ends and an outlet passage

having an opening entering the chamber through the other of said opposing ends,

an annular portion of said one end of the chamber immediately surrounding the inlet passage opening forming an annular concave valve seat,

an abutment means in the chamber, fluid openings being provided through the abutment means to permit fluid to flow from the inlet passage therethrough to the outlet passage, one end of the abutment means projecting towards the inlet opening,

a resilient disc which is essentially flat in its relaxed condition extending transversely across the chamber between the said one end of the abutment means and the annular valve seat, said disc being of a sufficiently large cross-section, taken in the direction transverse to the flow direction, that in its normal closed condition in the chamber, the said one end of the abutment means engages the central portion of the disc on the side thereof facing the outlet opening and flexes the disc convexly toward the inlet opening as the outer periphery of the disc sealingly engages the annular valve seat,

said fluid openings in the abutment means positioned to remain open for fluid flow from the inlet opening around the outer periphery of the disc and through the fluid openings to the outlet opening when the resilient disc has flexed toward the outlet opening as far as its outer dimensions and resilience allow when subjected to the largest possible pressure differential from the inlet opening toward the outlet opening,

said resilient disc having sufficient resiliency and arranged to increase the area of its sealing contact with the annular concave valve seat from said initial sealingly engaging outer periphery, radially inwardly, as the fluid forces from the outlet toward the inlet increase beyond the flexing force exerted by the abutment means on the disc,

and the outer periphery of the disc, when in the said normal closed position, being spaced radially inwardly from the outer periphery of the concave valve seat, permitting at least slight transverse movement of the disc within the chamber when sealingly engaging the annular valve seat.

3,889,711

LOW PRESSURE OPERABLE, DIAPHRAGM TYPE LOGICAL ELEMENT

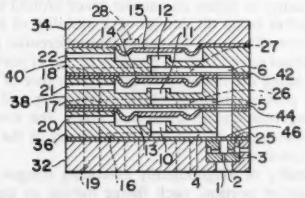
Toshiro Hirao, Yokohama, Japan, assignor to Meidensha Electric Mfg. Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1973, Ser. No. 346,407

Claims priority, application Japan, Apr. 1, 1972, 47-032148

Int. Cl. F15c *3/04*

U.S. Cl. 137—599 **5 Claims**



1. A low pressure operable, diaphragm-type logical element comprising:

a base having formed therein a main supply port, a base outlet port, and a plurality of base signal ports;

a plurality of superimposed, modular chamber defining plates vertically stacked on said base, each of said plates having formed therein a supply port to receive fluid from said main supply port, an intermediate nozzle, a relief discharge port intercommunicating with said supply port through said intermediate nozzle and a chamber signal port communicating with one of said base signal ports, at least one of said superimposed, modular chamber defining plates having formed therein an outlet port spaced from said supply port and communicating with said base outlet port;

a plurality of diaphragms disposed between adjacent chamber defining plates, each of said diaphragms facing one of said intermediate nozzles and each having a home position permitting communicating between said relief discharge ports and said supply ports through said nozzles and each of said diaphragms in conjunction with said adjacent chamber defining plates forming a plurality of signal receiving chambers into which one of said signal ports opens thereby forming a low pressure operable, diaphragm-type logical element capable of producing a signal at said base outlet when said signal receiving chambers receive a pressure signal and said diaphragms move to a position closing said nozzles, whereby the number of signal receiving chambers may be altered merely by stacking an appropriate number of pre-formed modular chamber defining plates one on top of the other.

3,889,712

VALVES

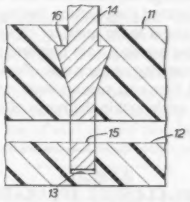
Robert E. Fields, 2-10 Regent St., Cambridge, England (CB2 1DB)

Filed Nov. 27, 1973, Ser. No. 419,300

Claims priority, application United Kingdom, Dec. 1, 1972, 55569/72

Int. Cl. F16k *11/02*

U.S. Cl. 137—625.47 **7 Claims**



1. A valve comprising:

a body constructed of a synthetic plastic material having at least one connection bore in a first plane and a further bore in a transverse plane which extends from at least one wall of the body and intersects each connection bore; and a key fabricated of a material harder than the body and formed with at least one transverse bore for alignment with one connection bore in the body, said key including a wedged ring section formed thereon and having a knife edge on the ring section, said key being a compression fit in said transverse bore in the body so that the knife edge of said wedge ring section engages the plastic material of said body portion.

3,889,713

RECIPROCATING VALVE FOR DOUBLE PISTON CONCRETE PUMP

Horst Bender, Lintorf, Germany, assignor to WIBAU (Westdeutsche Industrie-und Strassenbaumaschinen-Gesellschaft m.b.H.), Rothenbergen, Germany

Filed July 13, 1973, Ser. No. 379,195

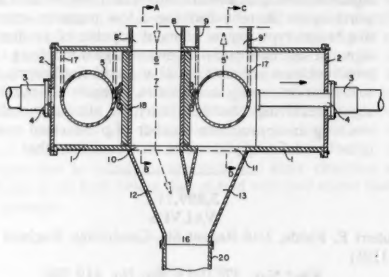
Claims priority, application Germany, July 20, 1972, 2235586

Int. Cl. F04b *7/00;* **F16k** *11/06*

U.S. Cl. 137—625.48 **2 Claims**

1. A valving apparatus for interconnecting a double piston pump having two cylinders with conveying conduit means and with supply means; comprising a cylindrical valve housing

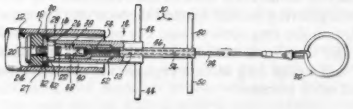
having a given length, said housing further having a first pair of aligned ports for connecting said valve housing to said two pump cylinders, a second pair of aligned ports for connecting the valve housing to conveying conduit means, and a third pair of aligned ports for connecting the valve housing to said supply means, said ports being aligned at a pair of planes extending transverse of the axis of said housing with each port of each pair of ports being aligned with a separate one of said planes, a piston valve plug mounted solely for axial movement in said cylindrical valve housing, said plug having a central plug section (6) with a straight cylindrical passageway extending diametrically through the valve housing in a direction to interconnect ports of said first and second pair in a common plane, a first outer plug section (5) with a bent cylindrical passageway, and a second outer plug section (5') also with a bent cylindrical passageway, said first and second outer plug sections and said central plug section having together a length corresponding to about three quarters of said given length of the cylindrical valve housing, said first and second outer plug sections (5, 5') extending on each side of said central passageway, each of said first and second bent cylindrical passageways including an angle within the range of about 75° to about 90° so as to extend.



3,889,714
PIPE CLOSURE APPARATUS

John F. Wilger; Tadao S. Uyetake, and Clifford Y. C. Lai, all of Honolulu, Hawaii, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 17, 1974, Ser. No. 434,169
Int. Cl. F16l *55/10*
U.S. Cl. 138—89 **3 Claims**

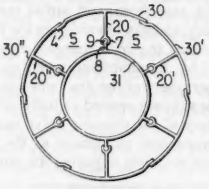


1. A pipe closure apparatus comprising:
a resilient plug;
a threaded shaft extending axially through the resilient plug;
means mounted on one end of the shaft to restrain longitudinal movement of the shaft with respect to the resilient plug, and a nut threaded on the opposite end of the shaft so that upon tightening or loosening the nut the resilient plug expands or retracts respectively;
a rigid washer slidably mounted on the shaft between the nut and the resilient plug for providing bearing surfaces and a distribution of force from the nut to the resilient plug;
a cup shaped resilient ring mounted about the washer; and said ring having an exterior diameter which is greater than the resilient plug when the plug is in its retracted condition and being capable of flexing inwardly,
means for retaining the shaft and selectively tightening or loosening said nut;
the retaining, tightening, and loosening means including:
a tube which has a shaped end for engaging the nut;
a pin extending from the nut end of the shaft; and
another tube slidable within the first mentioned tube and having a shaped end for engaging said pin,
whereby a pipe can be sealed from contamination by expanding the plug therein and is wiped clean by the ring when the plug is retracted and withdrawn.

3,889,715
ARRANGEMENT IN A PIPE FOR ENCLOSING INSULATION

Lars Harry Lilja, Solhem, Aspen, and Charles Folke Sigvard Ottoson, von Holtens vag 5, both of S-443 00 Lerum, Sweden

Filed June 26, 1973, Ser. No. 373,687
Claims priority, application Sweden, Jan. 10, 1972, 213/72
Int. Cl. F16l *9/18, 59/12*
U.S. Cl. 138—117 **10 Claims**

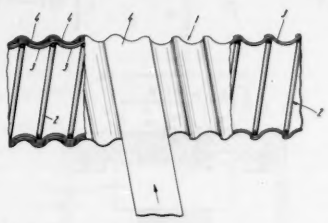


1. Means for enclosing an insulation around a pipe comprising
a. a jacket spaced from said pipe in a substantially concentric manner to define an annular space around said pipe, said jacket being divided along a plurality of longitudinally extending lines at spaced circumferential positions thereabout so as to form a plurality of jacket portions, the edges along the line of division of each pair of adjacent jacket portions maintained in overlapping and resilient abutting relationship with each other, the overlapping relationship maintained by the resiliency of the abutting jacket portions;
b. a plurality of longitudinally extending flanges, one for each jacket portion, each flange having an outer edge connected to the inner surface of the cooperating jacket portion between the edges thereof and extending in a substantially radial direction therefrom, each flange furthermore having an inner edge connected to the outer surface of said pipe, said flanges dividing the annular space into a plurality of longitudinally extending compartments, one between each pair of adjacent flanges;
c. said overlapping edges of each pair of adjacent jacket portions being resiliently separable by the pressure exerted by a means inserted therebetween for introducing insulation into said compartments.

3,889,716
REINFORCED FLEXIBLE HOSES AND THEIR MANUFACTURE

Georg Linhart, Ober-Wollstadt, Germany, assignor to Techn-Chemie Kessler & Co. GmbH, Frankfurt, Germany

Filed Sept. 21, 1973, Ser. No. 399,434
Claims priority, application Germany, Sept. 28, 1972, 2247554
Int. Cl. F16l *11/00*
U.S. Cl. 138—129 **4 Claims**



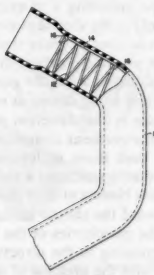
1. A reinforced flexible hose comprising:

a helically wound form-retaining flexible support coil; an inner hose layer consisting of a flexible ribbon helically wound about the convolutions of said coil, lengthwise marginal portions of said ribbon overlapping each other in juxtaposition with underlying convolutions of the coil; and an outer hose layer consisting of a second flexible ribbon helically wound about the inner layer in the same winding direction as the first ribbon, the lengthwise marginal portions of the second ribbon also overlapping each other in juxtaposition with the underlying coil convolutions, the portions of the ribbons intermediate the overlapping marginal portions thereof being disposed in substantially parallel relationship between adjacent coil convolutions, the overlapping marginal portions of the first ribbon being bonded to each other and to the underlying coil convolutions and the overlapping marginal portions of the second ribbon being bonded to each other and only to the underlying overlapping portions of the first ribbon.

3,889,717
REINFORCED FLEXIBLE TUBE

Richard Dick Obadal, Cedar Falls, and William David Loynachan, Reinbeck, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Dec. 14, 1973, Ser. No. 424,865
Int. Cl. F16l *11/00*, *11/10*
U.S. Cl. 138—131 **7 Claims**

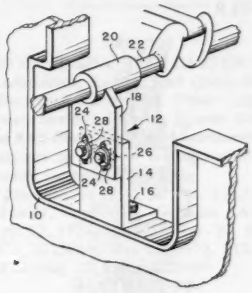


1. A tube of flexible material and a helical member disposed lengthwise within the tube and of material stiffer than the tube so as to reinforce the tube against radially inward collapse, characterized in that the member is freely disposed within the tube so as to be capable of being readily inserted into and withdrawn from the tube, and an elongated element relatively resistant to lengthwise compression and disposed within the tube and running lengthwise of the tube and member and attached to the member at lengthwise spaced-apart intervals to minimize axial migration of the member within and relative to the tube.

3,889,718
LOOM CRANKSHAFT SUPPORT

Joe T. Owings, Belton, and Sarden B. Martin, Williamstown, both of S.C., assignors to Deering Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 358,857, May 10, 1973, abandoned. This application Sept. 3, 1974, Ser. No. 502,845
Int. Cl. D03d *49/02*
U.S. Cl. 139—1 R **1 Claim**

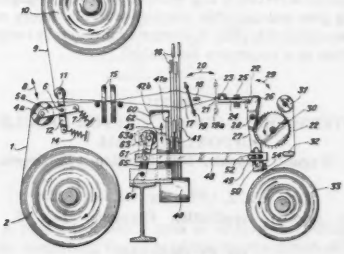


1. A loom crankshaft arrangement comprising: a loom frame, a first vertical support member having a horizontal slot and attached to said frame, a second vertical support member having a plurality of vertical slots through which it is adjustably connected to said first vertical support member at said horizontal slot, a sleeve bearing integrally connected to and supported on the top of said second vertical support member and a loom crankshaft projecting through said sleeve bearing.

3,889,719
WEAVING MACHINE FOR PRODUCING TERRY CLOTH

Eberhard Seifert, Sulz-Attikon, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed May 22, 1973, Ser. No. 362,812
Claims priority, application Switzerland, May 23, 1972, 7575/72
Int. Cl.[2] D03D *39/22*
U.S. Cl. 139—25 **12 Claims**



1. In a weaving machine for producing terry cloth having a plurality of shafts for forming a shed from warp yarns, a reed for beating a weft yarn with the shed into a cloth at a shed apex, first means for producing a periodic reciprocation of the cloth and shed apex between a partial beating-up position and

a full beating-up position relative to a front reversal position of said reed and an actuating means for individually moving said shafts to form a shed; a drive means connected between said actuating means and said first means for driving said first means from said actuating means, said drive means including a transmission means for selectively varying the duration of the periodic reciprocation of the cloth and shed apex relative to the motion of said shafts.

3,889,720

HEALD MACHINE

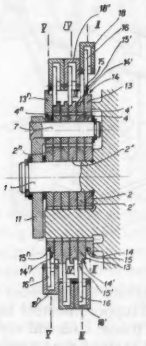
Allan William Henry Porter, Lustmuhle, Switzerland, assignor to Aktiengesellschaft Adolph Saurer, Switzerland

Filed Jan. 24, 1974, Ser. No. 436,388

Claims priority, application Switzerland, Jan. 25, 1973, 1053/73

Int. Cl.[2] D03C *1/00*; D03C *1/12*; D03C *5/00*

U.S. Cl. 139—66 R **6 Claims**



1. A loom dobby, for use in a loom having heald shafts, comprising, in combination, plural planetary gearings; a planet carrier; means mounting said planet carrier for oscillatory motion; means connected to said planet carrier and operable to impart oscillatory motion thereto; at least one planet gear shaft secured on said planet carrier; each planetary gearing including a respective planet gear mounted for free rotation on said planet gear shaft, a respective sun gear meshing with the associated planet gear, and a respective ring gear meshing with the associated planet gear; means mounting each sun gear and ring gear for free rotation; respective holding means operatively associated with each sun gear and its associated ring gear and selectively operable to hold one of the associated sun gear and ring gear stationary at least substantially at the same time as the direction of motion of said planet carrier is reversed; and means operatively engaged with each ring gear and operable, responsive to oscillatory motion of the associated ring gear, to impart a substantially reciprocatory motion to a respective heald shaft.

3,889,721

INTERMEDIATE CONNECTOR FOR HEDDLE SUPPORTING BEAM

Theodor Wagner, Heppstr. 149, Reutlingen-Betzingen, Germany

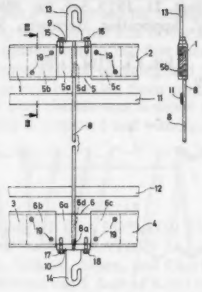
Filed Jan. 2, 1974, Ser. No. 430,035

Claims priority, application Germany, Jan. 4, 1973, 7300227

Int. Cl. D03c *9/06*

U.S. Cl. 139—91 **5 Claims**

1. In a heddle frame arrangement having two spaced parallel hollow beams connected together by end stays and by cross rods intermediate the end stays, the ends of said cross rods being connected to plate-like supporting members secured to said hollow beams, an improved connecting means comprising a stiffening and strengthening insert disposed inside at least a first one of the hollow beams at the connecting place of the associated supporting member, said supporting member being



secured to the outer wall of said first beam, the associated cross rod extending completely through said first beam and said insert.

3,889,722

BRAKING AND DRIVING DEVICE FOR THE SHUTTLE OF A WEAVING LOOM

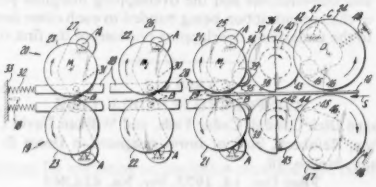
Allan William Henry Porter, Lustmuhle, Ar, Switzerland, assignor to Aktiengesellschaft Adolph Saurer, Switzerland

Continuation-in-part of Ser. No. 375,867, July 2, 1973, abandoned. This application Dec. 13, 1973, Ser. No. 424,543

Claims priority, application Switzerland, Sept. 4, 1972, 12991/72; Aug. 22, 1973, 11426/73

Int. Cl. D03d *49/24*, *49/54*

U.S. Cl. 139—142 **10 Claims**



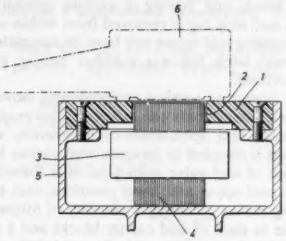
1. In a braking and driving device, for the shuttle of a weaving loom, of the type including a plurality of driven pulleys arranged consecutively in the shuttle movement direction with at least those pulleys serving to brake the shuttle being selectively movable into a working position, in which they cooperate with a shuttle moving in a shuttle guide box, and into an inoperative position and being driven at respective peripheral speeds which decrease in the direction of shuttle movement when braked, the improvement comprising, in combination, means mounting at least those pulleys serving to brake the shuttle for conjoint displacement in a plane transverse to the pulley axes; and means biasing at least those pulleys serving to brake the shuttle toward the shuttle guide box; the respective distances between the peripheries of the braking pulleys and the shuttle path decreasing in the direction of shuttle movement when braked, with the greatest of such distances, when the peripheries of the braking pulleys are not engaged with a shuttle, being not in excess of the thickness of the shuttle, whereby said braking pulleys are successively disengaged from the shuttle solely by engagement of the shuttle with the next succeeding braking pulley.

3,889,723

WEAVING MACHINE COMPRISING SHUTTLE BRAKING MEANS

Walther Filter, Langenhagen, Germany, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Vienna, Austria and Etablissement Wanderfield & Co., Schaan, Liechtenstein

Filed June 24, 1974, Ser. No. 482,801
Claims priority, application Austria, July 6, 1973, 5956/73
Int. Cl.[2] D03D *49/54*
U.S. Cl. 139—186 **5 Claims**



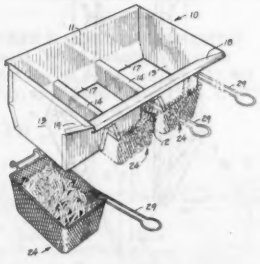
1. A weaving machine, which comprises
a shuttle race,
a vertical guide, which opens upwardly through said race,
a shuttle consisting at least in part of ferromagnetic material and movable along said shuttle race and over said guide, and
a solenoid, which is freely slidably movable upwardly in said guide from an initial position adjacent to said shuttle race into engagement with said shuttle when disposed over said guide, and which is energizable to have a predetermined range of action, which extends above said shuttle race,
said weaving machine, except for said shuttle and solenoid, being free of ferromagnetic parts in said range of action of said solenoid.

3,889,724

PLURAL APERTURE DISPENSER

Donald L. Anthony, 731 Crossbrook Dr., Moraga, Calif. 94556

Filed Oct. 3, 1973, Ser. No. 403,203
Int. Cl. B65b *1/04*
U.S. Cl. 141—1 **8 Claims**



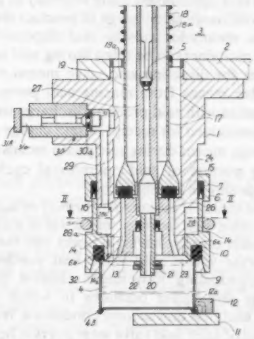
1. Plural aperture dispensing means for dispensing frozen uncooked sliced potatoes into fry baskets disposed on a multitier french fry storage rack, comprising:
a. a vertical, planar front panel having a lower portion inwardly converging at an angle from the vertical, thereby providing a lower angled surface for deflecting the potatoes into the corners of a plurality of fry baskets;
b. a vertical, planar back panel having an outwardly diverging upper portion at an angle from the vertical;
c. two vertical, planar end panels each having flanges corresponding to the outwardly diverging upper portion of said back panel, said front panel, back panel and end panels being serially joined to form the peripheral wall of said dispensing means; and,
d. a plurality of V-shaped partitions disposed between said front panel and said back panel to form a plurality of generally rectangular compartments within said peripheral wall whereby at least one side of each compartment is inwardly converging, said V-shaped partitions being further disposed with the apex of the partition uppermost, whereby the width of the bottom of each compartment is substantially smaller than the width of the top of each compartment.

3,889,725

METHOD OF FILLING BEER CANS OR THE LIKE

Friedrich Rademacher, Kamen; Karl Quest, Dortmund; Uwe Knabe, Dortmund-Hombruch; Dieter Unger, Waltrop; Heinz Jordan, Dortmund-Korne; Werner Heckmann, Dortmund, and Karl Plock, Dortmund-Lucklemberg, all of Germany, assignors to Holstein & Kappert Maschinenfabrik Phonix GmbH, Dortmund, Germany

Filed Jan. 8, 1974, Ser. No. 433,511
Claims priority, application Germany, Aug. 29, 1970, 2042990; Apr. 17, 1971, 7115418; Apr. 27, 1971, 2120544; May 10, 1971, 2123866; May 10, 1971, 2123865; May 22, 1971, 2126113; May 21, 1971, 2126099
Int. Cl. B65b *3/04*
U.S. Cl. 141—5 **4 Claims**



1. A method of filling cans or analogous containers with liquids, comprising the steps of placing the mouth of an empty container into sealing engagement with a gasket; raising the pressure in the thus sealed container by admitting into the container a compressed gas; introducing into the container a metered quantity of liquid by gravity flow; and thereupon raising the pressure in the filled container above the body of liquid therein to promote the separation of the mouth from the gasket.

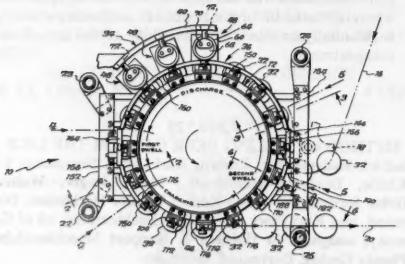
3,889,726
CONTAINER FILLING MACHINE

Joseph T. Stigler, Rochester, N.Y., assignor to Rostgo International Corporation, Tonawanda, N.Y.

Continuation-in-part of Ser. No. 358,851, May 10, 1973, Pat. No. 3,841,363, which is a continuation of Ser. No. 214,073, Dec. 30, 1971, abandoned. This application Dec. 19, 1973, Ser. No. 426,138

Int. Cl. B65b *57/02*

U.S. Cl. 141—142 **2 Claims**



1. In a rotary type container filling machine having a tank for storing flowable product to be dispensed by a plurality of dispensing units spaced annularly of said tank, each said dispensing unit including pump means, valve means and discharge means, said valve means having a first condition for placing its associated pump means in a flow communication with said tank during a pump means charging portion of the operational cycle of the machine whereby to permit said pump means to withdraw a charge of product from said tank and having a second condition for placing its associated pump means in flow communication with its associated product discharge means during a pump means discharge-container filling portion of said operational cycle whereby to permit said pump means to discharge said charge of product through said discharge means, means for moving said dispensing units in association with containers to be filled during said operational cycle, and means for disabling said valve means whereby to prevent said valve means from placing said pump means in flow communication with said product discharge means when no container is positioned for receipt of said charge of product from said discharge means during said pump means discharge-container filling portion of said operational cycle, the improvement comprising in combination:

each said valve means is mounted exteriorly of said tank and includes a valve seat portion and a valve stem portion, said valve stem portion having a lower end thereof slideably supported within said valve seat portion for free vertical reciprocating movements relative thereto between lower and upper positions in which said valve means is in said first and second conditions, respectively, an upper end of each said valve stem portion having a side opening notch;

a plurality of guide blocks spaced annularly of said tank in association one with each of said dispensing units, each of said guide blocks being fixed to said tank in a relatively spaced relationship vertically above its associated valve seat portion;

a plurality of carrier blocks associated one within each of said guide blocks and being supported thereby for free vertical reciprocating movements while being constrained against relative rotary movements relative thereto, each of said carrier blocks supporting said upper end of its associated valve stem portion for free vertical reciprocating movements while constraining said upper end against relative rotary movements relative thereto;

a plurality of latch devices carried one by each of said carrier blocks for normally coupling said upper end to its associated carrier block for conjunctive vertical movements therewith, each of said latch devices including a latch follower member, a stop lug, a shaft for mounting said latch follower member and said stop lug on said carrier block for conjunctive vertical pivotal movements about an essentially horizontally disposed pivot axis, said latch follower member having a normal constraining pivotal position wherein said stop lug is positioned within said notch of said upper end of its associated valve stem portion for coupling said upper end to its associated carrier block and having a release pivotal position wherein said stop lug is removed from within said notch for uncoupling said upper end from its associated carrier block, said latch follower member having upper and lower portions;

means for imparting vertical reciprocating movements to said carrier blocks between raised and lowered positions during each said operational cycle whereby when said upper end is coupled to its associated carrier block said lower end of said valve stem portion is forced to move between said upper and lower positions, said movement imparting means including a plurality of follower rollers fixed one to each of said carrier blocks and a stationary cam track means engageable by said follower rollers during each said operational cycle; and

said disabling means includes cam means cooperating with said upper portion of each said latch follower member for normally maintaining same in said normal constraining pivotal position during each operational cycle of said machine, and means for moving said cam means into engagement with said lower surface portion of each said latch follower member to move same into said release pivotal position only when said lower end of its associated valve stem portion is in said lower position and its associated carrier block is in said lowered position and no container is positioned for receipt of said charge of product from its associated discharge means.

3,889,727
FITTING DEVICE

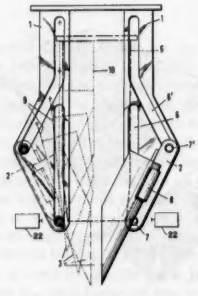
Willem Krul, Rotterdam, Netherlands, assignor to Halk B.V., Rotterdam, Netherlands

Filed Sept. 28, 1973, Ser. No. 401,713

Claims priority, application Netherlands, Sept. 29, 1972, 7213194

Int. Cl. B65b *1/04, 3/04*

U.S. Cl. 141—312 **4 Claims**



1. A filling machine for filling valve bags with quantities of materials, comprising

a vertically disposed filling tube having a nozzle piece at the lower end thereof,

a pair of guide shells disposed oppositely on either side of said nozzle piece, each guide shell partly encircling said nozzle piece, and

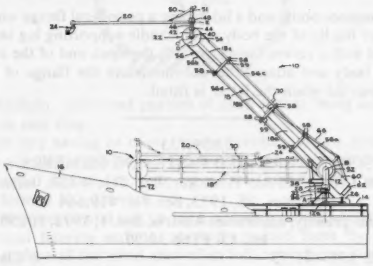
guide shell mounting means for guiding said guide shells in a movement that is both vertical and pivotal between a lower position wherein said shells are inclined relative to each other with their lower ends converging below said filling tube nozzle, and an upper position wherein said shells are in spaced, substantially parallel relation to each other and to said filling tube and closely encircle said tube.

3,889,728

MARINE LOADING ARM FOR BUNKERING VESSELS

Robert M. Riche, Sens, France, assignor to Societe Technique et Commercial d'Installations Industrielles "Luceat", Sens, France

Filed Apr. 23, 1973, Ser. No. 353,843
Claims priority, application France, Apr. 28, 1972, 72.15421
Int. Cl. B65b *3/04*; **B65g** *67/00*
U.S. Cl. 141—387 **12 Claims**



1. A tubular loading arm comprising:

a riser,

an inboard arm section mounted on the riser for pivotal movement in a generally vertical plane about a generally horizontal axis through the riser,

an outboard arm section, and

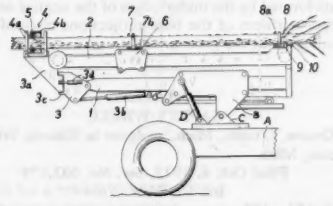
means pivotally interconnecting the inboard and outboard arm sections having three pivot axes, whereby the outboard section can be pivoted with respect to the inboard section in both a generally horizontal direction and a generally vertical direction independent of movement of said inboard section, and the outboard section can be moved between a forwardly extending operational attitude and a rearwardly extending stowed attitude wherein the outboard section generally overlies the inboard section and extends toward the riser.

3,889,729

TREE HARVESTING MACHINE

Skarl E. Pinomaki, 39160 Julkujarvi, Finland

Filed Nov. 8, 1973, Ser. No. 413,981
Claims priority, application Finland, Nov. 9, 1972, 3125/72
Int. Cl. B27c *9/00*
U.S. Cl. 144—3 D **10 Claims**



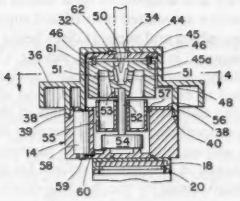
1. A tree harvesting machine, for felling and delimbing trees, cutting them into logs of fixed lengths, assorting and stacking the resulting logs; comprising, in combination: a longitudinally movable lifting and moving boom tiltably mounted on a vehicle provided with a driving machinery; a working boom articulated to one end of said lifting boom, tiltably attached and pivotable about two substantially perpendicular axes; means for gripping and cutting off a tree, including a cutting-off tool mounted transversally to the longitudinal direction of said working boom, on a support fastened as the front end of said working boom, and being in operative connection with the latter; a movable, first delimbing attachment having tools,, slidable by way of a tool carriage with guides along said working boom; said delimbing tools being arranged to clamp the tree during the movement of said carriage; a stationary, second delimbing attachment having tools, attached to the other end of one of said booms; wherein said second delimbing attachment is mounted on the other end of said lifting boom, said working boom is somewhat shorter than said lifting boom, and said second delimbing attachment is actuable on the tree when said booms are in a substantially parallel position; and support means at said other end of the lifting boom for the free end of said working boom when in the substantially parallel position.

3,889,730

PENCIL SHARPENER

John L. Buc, 144 Third Ave., Des Plaines, Ill. 60018

Filed Jan. 10, 1974, Ser. No. 432,249
Int. Cl. B43i *23/02*
U.S. Cl. 144—28.5 **6 Claims**



1. A pencil sharpener adapted to receive a blunted writing instrument and automatically form a sharpened point thereon, and the sharpener includes an electrically powered drive motor and power delivery means for driving said motor and said sharpener having a housing including a cover and a connected body portion, the improvement comprising:

an opening in the cover for insertion of a writing instrument and sharpening means being aligned with said opening, switch means being mounted adjacent said opening and having electrical connecting means coupled with both the power delivery means and the motor, and further, said switch means including sensing means extending into the sharpener for controlling operation of said drive motor, said sharpening means including a cutting head member comprising an outer cylindrical portion and an inner cutting portion including an aperture adapted to receive the writing instrument, a top plate between the cutting head member and said cover, said motor being mounted in said body portion and having a drive shaft coupled to said cutting member, and a ring shaped alignment bushing being positioned in aligned grooves of both the top plate and the cutting head member and thereby providing smooth concentric rotation of said cutting head member.

3,889,731

MACHINE FOR PRODUCING CIRCULAR PRODUCTS

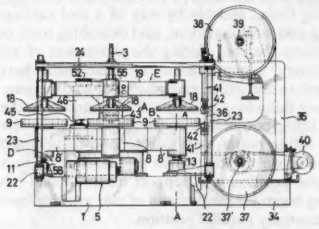
Suzuki Sempei, Hamamatsu, Japan, assignor to Suntory Limited, Osaka, Japan

Filed Mar. 11, 1974, Ser. No. 450,150

Claims priority, application Japan, Mar. 13, 1973, 48-29246

Int. Cl. B27h *3/04*

U.S. Cl. 147—36 **8 Claims**



1. A machine for producing circular products comprising a base having a blank feeding station, a blank sawing station, a blank chamfering station and a blank positioning station which are positioned on said base in a circumferentially spaced relationship, a vertically extending main drive shaft intermittently rotatably mounted on said base, blank support means fixedly mounted on said main drive shaft and having a plurality of equally spaced support discs, a blank holding-down means fixedly mounted on said main drive shaft above said blank support means and having a plurality of spaced blank holding-down members in opposition to said support discs, respectively and adapted to hold blanks in cooperation with their respective associated ones of said support discs, said holding-down members and support discs being adapted to be in succession disposed in said feeding, sawing, chamfering and positioning stations, vertically movable rotation transmission means positioned in each of said sawing and chamfering stations for engaging each of said blank support discs to transfer rotation to the support disc when the support disc is disposed in each of the sawing and chamfering stations, a rotational band saw positioned in said sawing station for sawing engagement with a blank held by the holding-down member and associated support disc when the member and disc are disposed in the sawing station, a rotational chamfering cutter positioned in said chamfering position for chamfering engagement with the sawn blank from said sawing station when the holding-down member and support disc holding the sawn blank therebetween are disposed in the chamfering station and detent means positioned in said positioning station to engage the holding-down and support disc in said positioning station so as to stop the movement of said holding-down and support discs disposed in the feeding, sawing, chamfering and positioning to thereby allow said band saw and cutter to perform their sawing and chamfering operations on the blanks positioned in these stations.

3,889,732

PLASTIC CONTAINERS

John B. Wilkins, Stenalees, St. Austell, Cornwall, England

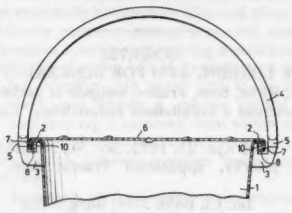
Filed Oct. 11, 1973, Ser. No. 405,459

Claims priority, application United Kingdom, Oct. 18, 1972, 47909/72

Int. Cl. B65d *1/00*

U.S. Cl. 150—48 **6 Claims**

1. A container comprising a molded plastic body having an open end formed with an outwardly projecting peripheral lip; at least one plastic handle molded integrally with said body; integrally formed outwardly projecting lugs disposed on opposite sides of the body; plastic ligament hinge portions molded integrally with said lugs and with said at least one handle, said hinge portions being spaced outwardly from said lip, and said at least one handle having a shape conforming to part of said lip, and being movable about said hinge portions between an inoperative position at one side of the container body and an operative, carrying, position extending across the open end of



the container body, and a lid having a peripheral flange which fits over the lip of the body, each handle-supporting lug being formed with a recess facing towards the open end of the container body and adapted to accommodate the flange of the container lid when the latter is fitted.

3,889,733

SCREW-THREADED FASTENING MEMBERS

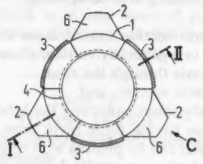
Kajetan Leitner, 18 Am Winacker, Bad Tolz D-817, Germany

Filed Nov. 28, 1973, Ser. No. 419,664

Claims priority, application Austria, Dec. 1, 1972, 10250/72

Int. Cl. F16b *39/00*

U.S. Cl. 151—41.73 **6 Claims**



1. A screw-threaded fastening member, to be mounted in a bore in a structural part, comprising a nut having a substantially cylindrical body from one end of which is formed at least two radially extending base projections the upper surfaces of which are in a common transverse plane, a crown portion of said substantially cylindrical body projecting axially above said plane, at least two conical sectors being formed from said crown portion and alternating angularly with said base projections so as not to overlap therewith around said nut, and said conical sectors having radially projecting underledges spaced axially from said plane and forming with said upper surfaces of said base projections in effect a circumferential groove about the crown portion, the groove which has opposed side portions formed by the underledges of the conical sectors and the upper surfaces of the base projections circumferentially alternating about the groove.

3,889,734

SAFETY WHEEL

Peter Owsen, Livonia, Mich., assignor to Ridonia Wheel, Inc., Livonia, Mich.

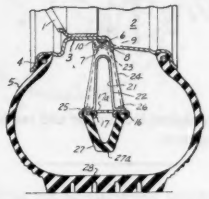
Filed Oct. 4, 1973, Ser. No. 403,479

Int. Cl. B60c *17/04*

U.S. Cl. 152—158 **36 Claims**

1. A safety wheel for a vehicle, said wheel having a rim to mount a tubeless tire,

an annular track carried by said rim,
an annular ring spaced outwardly from and having an approximately concentric relationship with said track,
a plurality of spacers disposed between said track and said ring to maintain said relationship,
a radially, inner end portion of each spacer terminating in an inner end wall, said inner end wall being slidably received by said track,
a pair of opposed, spaced apart side walls extending from each said inner end wall to said ring, to help support the load on said wheel,
reinforcing means disposed between said side walls to increase the load bearing capacity of each spacer,



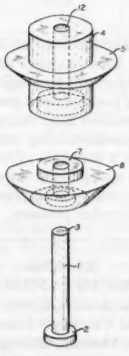
a radially, outer end portion of each spacer being secured to said ring,
said ring having an outer circumferential surface, and
an annular supplemental tire mounted upon said circumferential surface, so as to be within the annular chamber formed by a tubeless tire,
said supplemental tire having a circumferentially extending, load bearing surface, normally spaced from the inner surface of the tread area of an inflated tubeless tire, and being engageable upon said inner surface in free rolling contact therewith, if a tubeless tire is deflated, whereon said supplemental tire, said ring, said spacers, and said track support the load placed upon said wheel.

3,889,735

VEHICLE-TIRE STUD WITH RELATIVELY MOVABLE PARTS

Martti Salakari, 21500 Piikkio, Finland

Filed Nov. 27, 1973, Ser. No. 419,347
Claims priority, application Finland, Nov. 28, 1972, 3354/72
Int. Cl. B60c *11/00*
U.S. Cl. 152—210 **5 Claims**



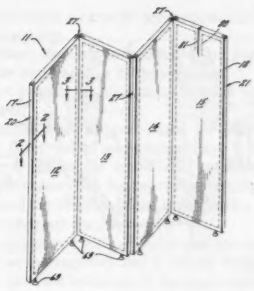
1. A stud for a vehicle-tire comprising:
a wear-resistant central member;
a pair of sleeve members surrounding said central member, said members being received in a tire, said sleeve members including an outer sleeve member flush with a wearing surface of the tire and an inner sleeve member embedded therein, said sleeve members being relatively displaceable with respect to each other and said central member being displaceable relative to said sleeve member and having a head adapted to project outwardly beyond said outer sleeve member, said inner sleeve member having a central hole receiving said central member and provided with a small and low swelling to hold said members together until said members are inserted in said tire.

3,889,736

DISPLAY SCREEN FOR EXHIBITS AND THE LIKE

Robert Firks, Deerfield, Ill., assignor to Firks Exhibitions, Inc., Chicago, Ill.

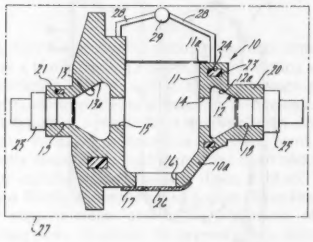
Filed May 18, 1973, Ser. No. 361,795
Int. Cl.² A47G *5/00*
U.S. Cl. 160—135 **6 Claims**



1. A multiple panel display screen comprising a plurality of panels hingedly joined together with detachable hinge strips and having moulding strips on the terminal edges of said screen, each of said panels comprising:
1. a rectangular wooden frame and a pair of thin structural sheets on the two broad opposite faces of said frame,
   a. said frame having a pair of grooves along substantially the entire length of two opposite edges of said frame,
   b. said grooves each having a shallow wide upper portion and a deep narrow portion,
2. extruded plastic retainer strips imbedded and secured in each of said grooves along substantially the entire length,
   a. said retainer strips each having a longitudinally extending access channel leading to a longitudinally extending undercut channel,
3. adjoining edges of said panels being hingedly joined together with a removeable, extruded plastic, hinge strip comprising a pair of similar hinge members each of generally T-shaped cross section,
   a. the top bar of said T being substantially the thickness of said panel, and being generally flat when said hinge strip is in said retainer strips,
   b. said members being integrally joined by a thin bridge portion along adjacent edges of the T's.
   c. each of said hinge members including a short central web and an integral bead,
   d. the webs being receivable in the access channels of said extruded plastic retainer strips and the beads being receivable in said undercut channel, and
4. removeable, extruded plastic moulding strips covering external edges of said panel,
   a. said moulding strips being of generally T-shaped cross section and including a cross-strip and a central strip,
   b. the top bar of said T being substantially the thickness of said panel,
   c. the central strip including a short central web and an integral bead, and

d. the web being receivable in said access channel and the bead being receivable in said undercut channel so that said cross strip is resiliently urged against the external edges of said panel to provide a permanent-appearing edge, said retainer strips and said moulding strip being interchangeable to provide for addition or removal of panels to said screen.

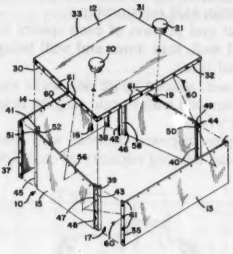
3,889,737
DRY SAND CORE PROCESS FOR USE WITH LOST FOAM MOLDING PROCESS
Ralph A. Olsen, Grosse Pointe Woods, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Jan. 4, 1974, Ser. No. 430,973
Int. Cl. B22c 9/04
U.S. Cl. 164—34 **9 Claims**



1. A method of forming metallic castings, comprising:
a. prepare a pattern from material which is combustible substantially without residue upon contact with molten metal, define said pattern with a remote internal cavity and a plurality of openings passing through the walls of said pattern to communicate with said cavity,
b. close off all except one of said openings substantially with refractory material either in the rigid form or loose particulate form supported by a thin consumable membrane,
c. locate said pattern in a molding apparatus,
d. fill said pattern with dry unbonded sand through said opening either simultaneously with filling of said apparatus with dry unbonded sand or prior to the filling of said apparatus with dry unbonded sand, compact said sand both within and about said pattern to achieve a density of at least 50–70%, and
e. introduce molten metal to pattern to displace said material.

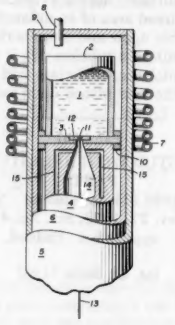
3,889,738
FIREPLACE EXTINGUISHER
John R. Murphy, Simms Bldg., Dayton, Ohio 45402
Filed Dec. 17, 1973, Ser. No. 425,492
Int. Cl. A62c 33/00
U.S. Cl. 169—49 **11 Claims**

1. A fire extinguisher of the type described, adapted to extinguish fires in a fireplace, including glowing embers, burning logs, and the like, comprising generally quadrilaterally shaped top, front, back and side panels, said panels possessing flange means for detachably interconnecting said panels, said front and back and said side panels being generally opposed, extending from the peripheral edges of said top panel, and forming in combination with said top panel an airtight chamber which, when placed over and enclosing a fire, prevents further combustion and extinguishes said fire, and said flanges being joined to one another by fastener means whereby said



chamber is readily assembled for use and readily disassembled for storage or shipment.

3,889,739
PRESSURIZED NITROGEN TO EXTRUDE MOLTEN STEEL-SILICON ALLOY
Lawrence F. Rakestraw, Raleigh, N.C., assignor to Monsanto Company, St. Louis, Mo.
Filed Nov. 12, 1973, Ser. No. 415,030
Int. Cl. B22d 11/12
U.S. Cl. 164—82 **2 Claims**



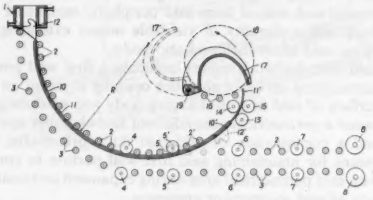
1. In the method for producing fine diameter wire from the melt of a steel-silicon alloy having a silicon concentration of from about 0.5 to 5.0 percent by weight based on the weight of the alloy, wherein a positive head pressure is provided over the melt to force the molten alloy through an orifice and into a film-forming oxygen-containing atmosphere as a free-streaming jet wherein a stabilizing film is formed about the peripheral surface of said jet, the improvement which comprises: effecting said positive head pressure over the melt by means of nitrogen gas under pressure.

3,889,740
CONTINUOUS CASTING PLANT
Bruno Tarmann, and Johann Knorr, both of Kapfenberg, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Austria
Filed July 5, 1973, Ser. No. 376,736
Claims priority, application Austria, Jan. 12, 1973, 248/73
Int. Cl. B22d 11/08
U.S. Cl. 164—274 **8 Claims**

1. A continuous casting plant comprising:
a. a water-cooled mould;

b. means extending from the mould for supporting and guiding a cast bar;

c. a dummy bar adapted to be connected at one end to a dummy head that is insertable into the mould to close an end of the mould, the dummy bar being composed exclusively of a flexible, elastically shapeable steel tape without articulated joints and having a thickness that is generally



constant along the length of the dummy bar and that is substantially smaller than the thickness of the smallest continuous bar to be cast in the plant; and

d. means extending from the mould for guiding the dummy bar, the guiding means being adapted to engage side margins of the dummy bar and to enclose at least one of said side margins.

3,889,741

APPARATUS FOR HARD FACING SAW BLADE TEETH

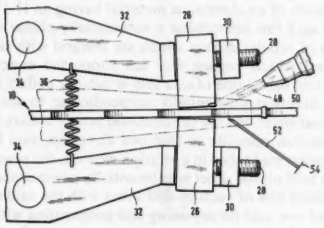
Otto Stier, Biberach an der Riss, and Heinz Kuhn, Mettenberg, both of Germany, assignors to Vollmer Werke Maschinenfabrik GmbH, Germany

Filed Apr. 26, 1974, Ser. No. 464,316

Claims priority, application Germany, Apr. 26, 1973, 2321161

Int. Cl. B22d *19/06*

U.S. Cl. 164—332 **16 Claims**



1. An apparatus for the application of a hard facing alloy to the teeth of saw blades which comprises a pair of side mold members arranged to straddle the sides of a saw blade, a movable stop member spearate from said side mold members arranged to successively engage the leading edges of saw teeth to aligh each successive tooth with the side mold members and to shape the leading edge of hard facing material deposited on the tooth, means for shifting the side mold members between open positions away from the saw blade and into closed positions forming mold cavities on opposite sides of a saw tooth to be hard faced, and said stop member having a shaping surface selectively closing the front ends of the mold cavities to cooperate therewith for shaping an alloy deposited on the tooth.

3,889,742

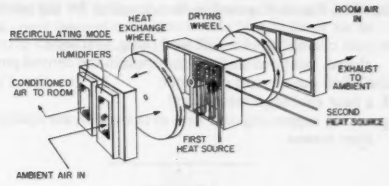
AIR CONDITIONING APPARATUS AND METHOD

William F. Rush, Arlington Heights; Jaroslav Wurm, North Riverside, and Raymond J. Dufour, Wheaton, all of Ill., assignors to Gas Developments Corporation, Chicago, Ill.

Filed Nov. 13, 1973, Ser. No. 415,323

Int. Cl. F23l *15/02*

U.S. Cl. 165—7 **10 Claims**



1. An open-cycle air conditioning apparatus for heating and cooling comprising:

an enclosure defining a treatment air passageway and a separate regenerative air passageway;

means for passing an air stream through each of said passageways;

a sensible heat exchanger means for transfer of thermal energy from one of said passageways to the other;

a desiccant means for transfer of moisture from the air treatment passageway to the regenerative air passageway and spaced toward the exhaust of the regenerative air stream from said heat exchanger means;

a first evaporative cooling means near the exit of the conditioned air passageway and a second evaporative cooling means near the entrance of the regenerative air passageway;

a low-temperature heater means in the regenerative air passageway between said sensible heat exchanger means and said desiccant means supplying heat to the entire regenerative air stream;

a high-temperature heater means in the regenerative air passageway between said low-temperature heater means and said desiccant means supplying regeneration heat to a portion of the regenerative air stream; and

a baffling means defining a passageway for said portion of the regenerative air stream through said high-temperature heater means and said desiccant means.

3,889,743

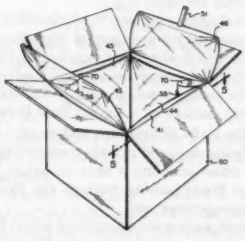
INFLATABLE INSULATION FOR PACKAGING

Michael C. Presnick, c/o Metatronics Manufacturing Corp. 111 Bloomingdale Rd., Hicksville, N.Y. 11801

Division of Ser. No. 124,717, March 16, 1971, Pat. No. 3,730,240. This application Jan. 2, 1973, Ser. No. 320,453

Int. Cl. F28f *7/00*

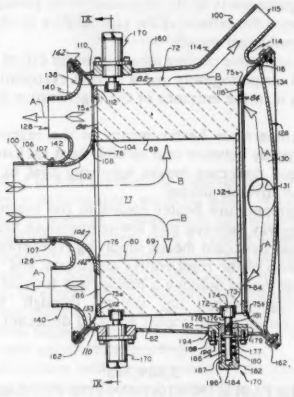
U.S. Cl. 165—46 **2 Claims**



1. A rigid package comprising

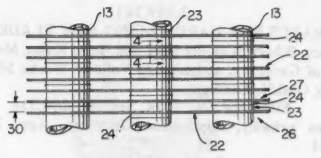
a. a rigid parallelepiped corrugated container having six planar walls;
b. a substantially inelastic liner means of thermoplastic material including a plurality of articulated inflatable insulating chambers;
c. each of said insulating chambers comprising spaced inner and outer walls joined at their edges by elongated heat seals, at least one of which seals is discontinuous for the communication of air between adjacent chambers;
d. valve means disposed in one chamber for the admission of air to all of said chambers;
e. said chambers when inflated being adapted to provide a closed, insulated storage space within the central portions of said paperboard container;
f. a heat exchange means; and
g. means supporting said heat exchange means against said liner means.

3,889,744
RECUPERATOR STRUCTURES AND METHOD OF MAKING SAME
James A. Hill, and George E. Keefer, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio
Filed Apr. 20, 1972, Ser. No. 245,933
Int. Cl. F28f *21/04*
U.S. Cl. 165—83 **19 Claims**



1. Recuperator apparatus, comprising
a. A glass-ceramic heat exchanging body having an internal surface defining an inner chamber formed in said body, a peripheral surface spaced outwardly from said internal surface, and spaced end surfaces connecting said internal and peripheral surfaces;
b. said body including a portion in which a first and a second series of passageways are formed therethrough, the passageways of said first series extending and enabling passage of a first fluid between said internal and peripheral surfaces, the passageways of said second series extending and enabling passage of a second fluid between said end surfaces, the walls of said first and second series of passageways being disposed in heat transmitting relationship with each other enabling a heat exchange between first and second fluids passing through the first and second series of passageways; and
c. first ductwork means for channeling a first fluid to one of said inner chamber and peripheral surfaces and collecting said fluid as it issues from the other of said inner chamber and peripheral surfaces,
d. second ductwork means for channeling a second fluid to one of said end surfaces and collecting said second fluid as it issues from the other of said end surfaces, and
e. housing means for surrounding and supporting said heat exchanging body in a relatively stationary position during relative expansion and contraction movements of components of said apparatus to aid in maintaining inlets and outlets of said first and second series of passageways positioned for connection with said first and second ductwork means,
f. said housing means, including an outer shell disposed around and spaced from said peripheral surface of said body and a plurality of yieldable means extending between said outer shell and said body,
g. said first ductwork means including a first wall portion surrounding an inner chamber opening adjacent an end surface of said heat exchanging body and extending between a perimetrical area adjacent said chamber opening and a continuation of said first ductwork means, and means for maintaining said first wall portion in contact with said perimetrical area during expansion and contraction of said recuperator apparatus.

3,889,745
HEAT EXCHANGER AND METHOD OF MAKING SAME
Frederik A. Siemonsen, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.
Filed Dec. 19, 1973, Ser. No. 426,320
Int. Cl. F28f *1/22*
U.S. Cl. 165—151 **6 Claims**

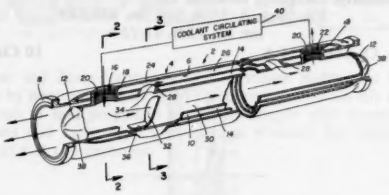


1. A heat exchanger core assembly comprising a plurality of tubes arranged in substantially parallel relation and a plurality of fins made of an aluminous material having an H-19 temper, each of said fins comprising a substantially planar sheet and two sets of tubular collars which are integral with said planar sheet and which engage and are supported concentrically around said tubes, one of said sets of tubular collars extending in one direction substantially perpendicular to the plane of said planar sheet and the other of said sets of collars extending in a direction opposite to said one direction, said fins being fixed against said tubes in a relation wherein the plane defined by each said planar sheet is substantially perpendicular to the longitudinal axis of each of said tubes with the said one set of collars of one said fin adjoining and cooperating with the said other set of collars of an immediately adjacent fin to provide a spacing between said one and immediately adjacent fin.

3,889,746
HEAT EXCHANGER
Ernest Laffranchi, P.O. Box 455, Ferndale, Calif. 95536
Filed Dec. 14, 1973, Ser. No. 425,025
Int. Cl. F28d *7/10*
U.S. Cl. 165—155 **3 Claims**

1. A heat exchanger for fluid food products comprising an outer tube having an inner diameter and a concentric inner tube having an outer diameter less than the inner diameter to define an annular product flow space between the two tubes, the outer tube including at its ends means for coupling it to a product pipe line and having an outer diameter only insignificantly larger than the pipe line diameter, the outer tube fur-

ther including means defining an annular, concentric coolant flow space surrounding the product flow space and extending over a portion of the total length of the outer tube, radially oriented coolant inlet and outlet ports defined by hollow cylindrical members connected to the inner tube, extending to the exterior of the outer tube, and communicating an interior of the inner tube with the exterior of the outer tube, each member including an interior thread extending from the outer



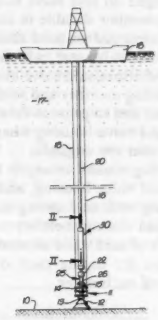
end of the member towards the other end thereof for threadably connecting the members to a coolant circulating system, and generally radially disposed, cylindrical coolant passages disposed upstream and downstream of the inlet and outlet ports, respectively, for flowing a portion of the coolant from the inner tube to the annular space in the outer tube and back to the inner tube before discharge from the heat exchanger through the outlet port.

3,889,747

TELESCOPIC RISER TENSIONING APPARATUS

A. Michael Regan, Huntington Beach, and Bruce J. Watkins, Palos Verdes Estates, both of Calif., assignors to Regan Offshore International, Inc., San Pedro, Calif.

Filed July 23, 1973, Ser. No. 381,531
Int. Cl. E21b *43/01*
U.S. Cl. 166—.5 **6 Claims**



3. A telescopic riser tensioning apparatus for applying tension between upper and lower couplings of a telescopic joint in a subsea riser conduit run from a floating vessel to a subsea wellhead comprising:

a surge chamber and means for connecting said chamber in fluid communication with the interior of said riser conduit, said surge chamber comprising an annular chamber and means for mounting it about at least one of said couplings;

at least one or more piston and cylinder means connected across said joint for tensioning said upper and lower couplings toward one another upon introduction of fluid under pressure into each said piston and cylinder means; and

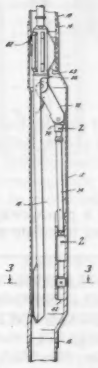
means for connecting said surge chamber to each said piston and cylinder means in fluid communication whereby fluid pressure within said riser conduit is transmitted via said surge chamber to said piston and cylinder means.

3,889,748

APPARATUS FOR INSTALLING AND REMOVING FLOW CONTROL DEVICES FROM A MANDREL HAVING ONE OR MORE POCKETS

Gilbert H. Tausch, Houston, Tex., assignor to Perry R. Bass, Inc. and Sid W. Richardson Foundation, both of Fort Worth, Tex., part interest to each

Filed Jan. 28, 1974, Ser. No. 437,236
Int. Cl. E21b *7/06*
U.S. Cl. 166—117.5 **5 Claims**



1. In a flow control handling apparatus adapted for use in placing a flow control device in or removing a flow control device from a well mandrel having a plurality of flow control device receiving pockets which are positioned side by side to each other and including an orientation sleeve having a longitudinal orientation slot positioned in a predetermined radially spaced relationship relative to said pockets, said apparatus including a support body, an orientation key pivotally connected to the body for engagement with the orientation slot, a shifting arm pivotally supported from the support body, the improvement comprising,

a flow control handling device connected to the shifting arm, said flow control handling device including a plurality of vertically directed connections which are positioned side by side to each other for supporting flow control device running and pulling tools, said connections spaced for alignment with the plurality of receiving pockets.

3,889,749

INFLATABLE PACKER

Stanley O. Hutchison, Bakersfield, Calif., assignor to Chevron Research Company, San Francisco, Calif.

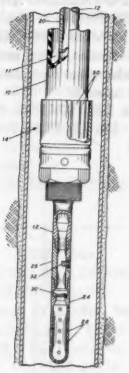
Filed June 6, 1973, Ser. No. 367,602
Int. Cl. E21b *33/127*
U.S. Cl. 166—187 **4 Claims**

1. An inflatable packer comprising a tubing section,

an elongated resilient sleeve slideably positioned over said tubing section,

clamping means including a mandril section slidably mounted in fluid-tight relationship on said tubing section disconnectably connecting the ends of said sleeve in fluid-tight relationship with said tubing section to form an annular chamber between said tubing section and said sleeve, clamping rings connectable to the exterior of said

tubing section above and below said mandril section of said clamping means to limit the movement of said clamping means on said tubing section and

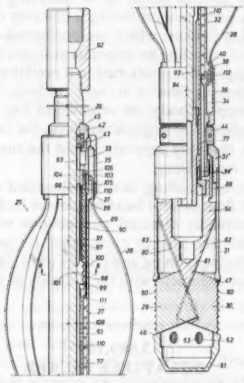


port means providing a passageway for flowing fluid into said annular chamber to inflate said resilient sleeve.

3,889,750
SETTING AND RELEASING APPARATUS FOR SIDEWALL ANCHOR

Albert A. Mullins, Boling, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed July 17, 1974, Ser. No. 489,346
Int. Cl. E21b *23/00, 33/12*
U.S. Cl. 166—217 **14 Claims**

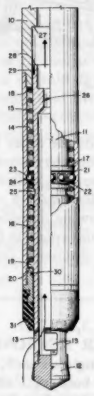


1. Apparatus adapted for use in anchoring a well tool in a well bore, comprising: an elongated housing member carrying anchor means that are movable between retracted and extended positions; expander means movable in one longitudinal direction along said housing member for extending said anchor means into anchoring contact with a well bore wall and in the opposite longitudinal direction for enabling retraction of said anchor means; a mandrel coupled to said housing member and movable rotationally and longitudinally with respect thereto; means responsive to rotation of said mandrel for feeding said expander means in said one direction along said housing member to extend said anchor means; means responsive to longitudinal movement of said mandrel for disabling said feeding means and allowing movement of said expander means in said opposite direction; and means operable upon disengagement of said feeding means for automatically shifting said expander means in said opposite direction.

3,889,751
SUBSURFACE SAFETY VALVE

Beldon A. Peters, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Feb. 1, 1974, Ser. No. 438,889
Int. Cl. E21b *43/12*
U.S. Cl. 166—224 A **10 Claims**



1. A subsurface safety valve for use in controlling flow of well fluids through well pipe, comprising:
a valve housing connected to said well pipe;
a valve seat arranged on said valve housing;
a tubular sliding member slidable in said valve housing;
a valve element arranged on said sliding member for engagement with said valve seat, said sliding member having openings therein above said valve element to permit flow through said sliding member and said valve housing when the valve is open and to prevent flow through said sliding member and said valve housing when said valve element and said valve seat are engaged;
a plurality of spring means arranged between said sliding member and said valve housing; and
means cooperating with said spring means and said valve housing and said sliding member to cause snap action positive closure of said valve element on said valve seat, including means for urging each of said spring means independently of each other.

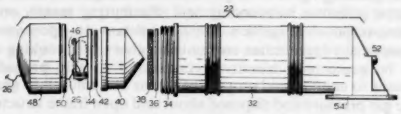
3,889,752
MOTOR VEHICLE FIRE EXTINGUISHER

Byron G. Dunn, 6831 Orchid Ln., Dallas, Tex. 75230

Continuation-in-part of Ser. No. 131,333, April 5, 1972, Pat. No. 3,773,111, and Ser. No. 400,623, Sept. 25, 1973, and Ser. No. 400,640, Sept. 25, 1973. This application Nov. 19, 1973, Ser. No. 416,871
Int. Cl. A62c *35/12*
U.S. Cl. 169—59 **9 Claims**

1. A fire extinguishing system for the engine compartment of a motor vehicle, comprising, a generally cylindrical container mounted on the interior of said compartment, a solid, powder-form fire extinguishing agent disposed in said container, dispersing means operatively mounted on said container to distribute said extinguishing agent throughout said compartment, propellant means in said container adapted to

generate a gas pressure sufficient to force said extinguishing agent through said distributing means and including gas-impermeable piston means mounted adjacent said extinguishing agent and in gas-tight relation with the walls of said container and flame-responsive ignition means resistant to ignition by heat generated in said compartment, operatively connected to said propellant means to actuate said propellant means and cause it to generate gas pressure and disposed about said compartment.



3,889,753

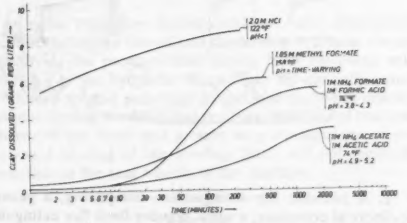
BUFFER REGULATED MUD ACID

Edwin A. Richardson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 21, 1974, Ser. No. 444,207

Int. Cl. E21b *43/27*

U.S. Cl. 166—307 **12 Claims**



8. A process for acidizing a siliceous material in a remote location into which a fluid can be flowed, which comprises:

flowing fluid into said remote location to contact the material to be acidized; and

including in the fluid an aqueous solution which, at the time of its inclusion, contains an amount of fluoride salt equivalent to at least an effective amount of hydrogen fluoride for acidizing a siliceous material, at least enough weak acid to convert the fluoride salt to an effective amount of hydrogen fluoride, and enough weak acid salt to provide a ratio of weak acid to weak acid salt that limits the rate of siliceous material acidization to substantially a selected rate.

3,889,754

FIRE EXTINGUISHING SYSTEM

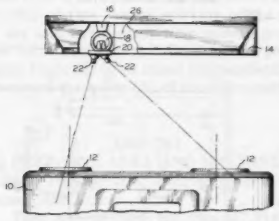
Byron G. Dunn, 6831 Orchid Ln., Dallas, Tex. 75230

Continuation-in-part of Ser. Nos. 131,333, April 5, 1971, Pat. No. 3,773,111, and Ser. No. 237,515, March 23, 1972, abandoned. This application Sept. 25, 1973, Ser. No. 400,623

Int. Cl. A62c *35/02*

U.S. Cl. 169—59 **47 Claims**

1. An improved fire extinguishing system, comprising; container means; a body of dry, powder-form fire extinguishing agent comprising a metal carbonate selected from the group consisting of alkali metal carbonates, alkali metal bicarbonates, alkaline earth metal carbonates, alkaline earth metal bicarbonates and mixtures thereof, in a major amount of about 50 to 95 percent by weight, and a synthetic metal silicate, in a minor amount of about 50 to 5 percent by weight and sufficient to form an air-impermeable coating on the burning surface to which it is applied and prevent reignition of an extinguished flame for at least 10 minutes, disposed in said container; expelling means for expelling said extinguishing agent from said container; and a flame-actuated sensor means, resistant to spontaneous ignition at temperatures normally encountered in said area to be protected, operatively connected to said expelling means to actuate said expelling means when a flame contacts said sensor means and said sensor means burns, extending from said container and freely exposed in said area to be protected.



3,889,755

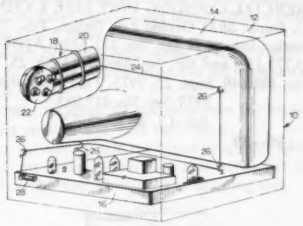
ELECTRICAL APPLIANCE FIRE EXTINGUISHER

Byron G. Dunn, 6831 Orchid Ln., Dallas, Tex. 75230

Continuation-in-part of Ser. Nos. 131,333, April 5, 1971, Pat. No. 3,773,111, and Ser. No. 400,623, Sept. 25, 1973, and Ser. No. 400,640, Sept. 25, 1973. This application Nov. 19, 1973, Ser. No. 416,870

Int. Cl. A62c *35/02*

U.S. Cl. 169—59 **11 Claims**



1. A fire extinguishing system for an electrical appliance having a cabinet surrounding its working parts, comprising, a generally-cylindrical container mounted in said cabinet, a solid, powder-form fire extinguishing agent disposed in said container, dispersing means operatively mounted on said container to distribute said extinguishing agent throughout said cabinet, propellant means in said container adapted to generate a gas pressure sufficient to force said extinguishing agent through said distributing means an including gas-impermeable piston means mounted adjacent said extinguishing agent and in gas-tight relation with the walls of said container and flame-responsive ignition means resistant to ignition by heat generated in said cabinet, operatively connected to said propellant means to actuate said propellant means and cause it to generate gas pressure and disposed about said cabinet.

3,889,756

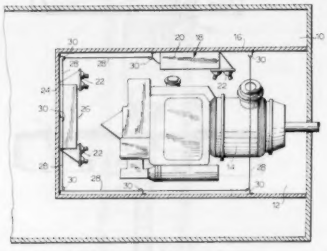
MARINE VESSEL FIRE EXTINGUISHER

Byron G. Dunn, 6831 Orchid Ln., Dallas, Tex. 75230

Continuation-in-part of Ser. Nos. 131,333, April 5, 1971, Pat. No. 3,773,111, and Ser. No. 400,623, Sept. 25, 1973, and Ser. No. 400,640, Sept. 25, 1973. This application Nov. 19, 1973, Ser. No. 417,080

Int. Cl. A62c *35/02*

U.S. Cl. 169—59 **7 Claims**



1. A fire extinguishing system for use in a confined, enclosed compartment of a marine vessel, comprising, at least one fire extinguishing unit, including a generally-cylindrical container mounted in said compartment, a solid, powder-form fire extinguishing agent disposed in said container, dispersing means operatively mounted on said container to distribute said extinguishing agent throughout said compartment, propellant means in said container adapted to generate a gas pressure sufficient to force said extinguishing agent through said distributing means and including gas-impermeable piston means mounted adjacent said extinguishing agent and in gas-tight relation with the walls of said container and flame-responsive ignition means resistant to ignition by heat generated in said compartment, operatively connected to said propellant means to actuate said propellant means and cause it to generate gas pressure and disposed about said compartment.

3,889,757

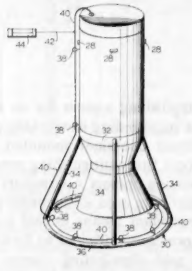
COMMERCIAL COOKING UNIT FIRE EXTINGUISHER

Byron G. Dunn, 6831 Orchid Ln., Dallas, Tex. 75230

Continuation-in-part of Ser. No. 131,333m April 5, 1973, Pat. No. 3,773,111, and Ser. No. 400,623, Sept. 25, 1973, and Ser. No. 400,640, Sept. 25, 1973. This application Nov. 19, 1973, Ser. No. 417,083

Int. Cl. A62c *35/02*

U.S. Cl. 169—59 **8 Claims**



1. A fire extinguishing system for a cooking complex having a plurality of individual cooking units, comprising, a plurality of individual extinguishing systems equal in number to the number of said cooking units, each of said extinguishing systems, comprising, a container, a dry, chemical extinguishing agent disposed in said container, distributing means operatively mounted on said container and adapted to distribute said extinguishing agent over the cooking unit to be protected, propellant means within said container adapted to generate a gas pressure on said extinguishing agent sufficient to force said extinguishing agent through said distributing means, an open frame structure surrounding said distributing means, and a flame-responsive ignition means resistant to spontaneous ignition at temperatures encountered above said cooking unit to be protected, operatively connected to said propellent means to actuate said propellant means and cause it to generate gas pressure and disposed about said open frame structure.

3,889,758

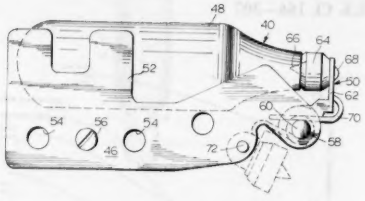
HAND OPERABLE FIRE EXTINGUISHER

Byron G. Dunn, 6831 Orchid Ln., Dallas, Tex. 75230

Continuation-in-part of Ser. No. 131,333, April 5, 1971, Pat. No. 3,773,111, and a continuation-in-part of Ser. No. 400,623, Sept. 25, 1973, and a continuation-in-part of Ser. No. 400,640, Sept. 25, 1973. This application Nov. 19, 1973, Ser. No. 417,082

Int. Cl. A62c *13/20*

U.S. Cl. 169—74 **9 Claims**



1. A portable fire extinguisher, comprising, a generally-cylindrical container, a solid, powder-form fire extinguishing agent disposed in said container, distributing means operatively mounted on said container and adapted to distribute said extinguishing agent over the area of a fire, propellant means in said container adapted to generate a gas pressure on said extinguishing agent sufficient to force said extinguishing agent through said distributing means and including a gas-impervious piston means mounted in gas-tight relation with the side walls of said container adjacent said extinguishing agent and hand-operable actuating means operatively connected to said propellant means to actuate said propellant means and cause said propellant means to generate gas pressure.

3,889,759

HYDRAULICALLY PROPELLED VEHICLE

Roger L. Larson, Waconia, Minn., assignor to Raygo, Inc., Minneapolis, Minn.

Filed Feb. 4, 1974, Ser. No. 439,528

Int. Cl. A01b *67/00;* **A01b** *49/02*

U.S. Cl. 172—3 **4 Claims**

1. In an earth working machine having traction wheels at its rear and a compacting drum and leveling blade at its front, the compacting drum being power driven to coact with the traction wheels in effecting propulsion of the machine and being rotatably connected with a yoke that projects forwardly from the chassis of the machine, and the leveling blade being mounted on said yoke ahead of the compacting drum for maximum effectiveness, said machine being characterized by an improved propulsion system which assures continued propulsion of the machine regardless of diminished traction between the drum and ground due to the inevitable upward force on the yoke resulting from loading of the leveling blade during use thereof,

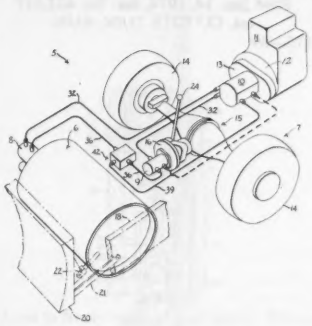
and which improved propulsion system comprises:

A. a power driven bidirectional hydraulic pump;

B. a reversible hydraulic motor drivingly connected with the drum;

C. a second reversible hydraulic motor drivingly connected with the traction wheels;

D. a closed loop parallel hydraulic circuit including supply lines leading to the hydraulic motors connecting the pump with the hydraulic motors and through which pressure fluid is delivered to both of said motors; and



E. an equal ratio flow divider-combiner valve mechanism connected in one side of said closed loop hydraulic circuit to divide the pressure fluid issuing from the pump and flowing to the hydraulic motors into substantially equal volumes so that reduction in the load on the hydraulic motor driving the drum and resulting from loss of traction between the drum and ground as a consequence of increased loading of the leveling blade will not diminish traction at the rear wheels of the machine.

3,889,760

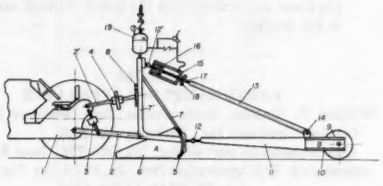
COMBINED SMOOTHER AND ROLLER-PACKER

Gedalyahu Manor, Haifa, Israel, assignor to Technion Research and Development Foundation, Ltd. and Aharon Kipnis, both of Haifa, Israel

Filed July 11, 1973, Ser. No. 311,428

Int. Cl. A01b *49/02*

U.S. Cl. 172—175 **9 Claims**



1. A tractor-drawn agricultural implement for the simultaneous smoothing and packing of soil comprising

a smoother (A) having a blade (5), side shields (6), a supporting structure (7), and a three-point hitch linkage (2, 2', 4) to a tractor (5);

a roller-packer (B) having a frame (10), a horizontal roller (9) rotatably arranged in the frame, a draw-bar (11), and a universal joint (12) at its front end, the universal pivot joint connecting to a point substantially central with respect to the smoother blade (5);

a rigid stiffening link (13) pivoted at both ends for holding the smoother (A) and the roller-packer (B) in fixed relationship, the pivot (14) at its rear end being centrally attached to the roller frame (10), and the pivot (12') at its front end including a universal pivot joint, connected to a point on the smoother (A), central in relation to, above and remote from, the smoother blade (5);

and adjustable retaining force means interposed between the smoother (A) and the roller-packer (B) in any portion of the stiffening link (13), which force means are adjusted to hold the roller and the smoother blade in fixed relationship during normal working of the soil, and to break the said fixed relationship upon a predetermined tractive force acting on said force means, permitting the smoother blade (5) to be raised independently of vertical movement of the roller (9) of the roller-packer (B).

3,889,761

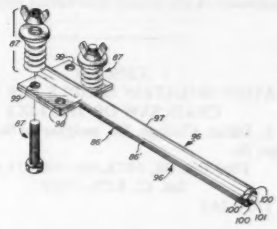
DEEP-TINE AERATING MACHINE

Roy H. Rogers, Tucson, Ariz., assignor to R & R Products, Inc., Tucson, Ariz.

Filed Apr. 4, 1974, Ser. No. 457,916

Int. Cl. A01b *15/00*

U.S. Cl. 172—706 **5 Claims**



1. A tine for penetrating turf comprising:

a pair of matching semi-circular concave elongated members which, when juxtapositioned to each other with their concave surfaces facing each other, form a hollow passageway axially therethrough,

said members being tapered along at least a part of their lengths toward one common end to aid in penetrating the turf, and

tension means attached to said members for biasing them into matching engagement with each other,

said means permitting said members to spread apart a limited amount under penetrating and withdrawl pressures exerted on the tine when used in aerating turf.

3,889,762

ROCK BREAKING MACHINE

Brian Sumner, Rainford, England, assignor to Dobson Park Industries Limited, Nottinghamshire, England

Filed Jan. 25, 1974, Ser. No. 436,635

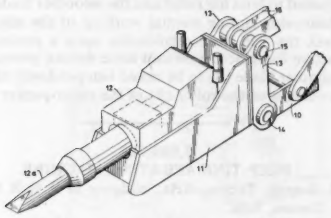
Claims priority, application United Kingdom, Feb. 17, 1973, 7921/73

Int. Cl. E25d *17/00*

U.S. Cl. 173—139 **5 Claims**

1. In combination a reciprocating rock-breaking impact tool and means for mounting said impact tool on a rock-breaking machine, said mounting means comprising a cradle having means for attaching it to an arm of a rock-breaking machine, guide means located in and carried by said cradle and extending in the direction of reciprocation of the impact tool, a base plate, for the impact tool, slidably mounted on said guide means, a bracket on said base plate, rod means located in and carried by the cradle and extending in the direction of reciprocation of the impact tool and passing freely through said

bracket, abutment means and a series of shock absorbing cushions assembled on said rod means and held between said



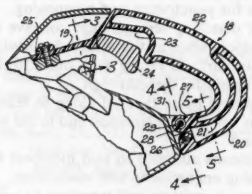
abutment means and said bracket thereby to control and damp oscillation of the impact tool during operation thereof.

3,889,763

VIBRATION ISOLATION HANDLE FOR PORTABLE CHAIN SAW OR THE LIKE

William E. Dillon, Chicago, Ill., assignor to Skil Corporation, Chicago, Ill.

Filed Oct. 31, 1973, Ser. No. 411,416
Int. Cl. B27b *17/02*
U.S. Cl. 173—162 **8 Claims**



1. In a portable tool of the type which is powered by an internal combustion engine, the improvement comprising:

a. said tool including frame means;

b. an internal combustion engine directly and rigidly mounted on said frame means whereby upon operation of said engine said frame means vibrates at a disturbing frequency W;

c. a handle in the form of an elongated, flexible member, said handle being of unitary, homogeneous construction such that all portions of the handle vibrate together in unison; and

d. first and second connection means respectively, connecting opposite ends of said handle member to said frame means with at least one end of said handle member being rigidly secured to said frame means by said first connection means, said handle member, as a consequence of its material composition, of its shape and of the action of said first and second connection means, having a natural vibratory frequency Wn such that

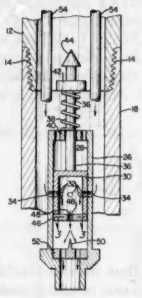
$$\frac{W}{W_n} > \sqrt{2}$$

3,889,764

WELL DRILLING METHOD AND APPARATUS

John G. Jackson, Aurora, Colo., assignor to Leon Du Charme, Denver, Colo., a part interest

Filed Jan. 14, 1974, Ser. No. 432,817
Int. Cl.² E21B *21/04, 43/00*
U.S. Cl. 175—69 **9 Claims**



8. Method of drillling or reworking a well having a bore extending into a formation having relatively low fluid pressure and containing debris, such as sand, which it is desired to remove with a circulating foam, comprising the steps of:

a. drilling into said debris with a conventional hollow rotatable drill string having a drill bit at its lower end adapted to produce an annulus surrounding the drill string,

b. introducing foam producing ingredients, such as air, water and a foaming agent through the drill string for delivery at the lower end thererof,

c. flowing the delivered ingredients through a control valve to maintain a discharge pressure less than the surrounding formation fluid pressure to obviate flow of the debris into the formation, and

d. discharging the ingredients through an orifice adjacent the drill bit to convert the ingredients into a lighter density foam adapted to carry the debris through said annulus to the surface.

3,889,765

EARTH SAMPLING APPARATUS

William P. Henson, Indianapolis, Ind., assignor to Mobile Drilling Company Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 260,776, June 8, 1972, abandoned. This application Nov. 29, 1973, Ser. No. 420,105
Int. Cl. E21b *11/00, 1/00*
U.S. Cl. 175—257 **22 Claims**

1. An apparatus for raising and then dropping a tool comprising:

a frame;

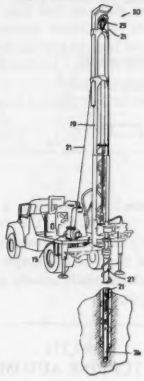
a tool;

a drum rotatably mounted on said frame and having a line wrapped thereon connected to said tool;

a reversible motor mounted on said frame and having an output rotatable in a first direction for lifting said tool and rotatable in a second opposite direction for allowing said tool to fall toward the earth; and,

clutch means mounted on said frame being operable to drivingly connect said output to said drum when said output is rotated in said first direction and having means

operable to disconnect said output from said drum when said output is rotated in said second direction allowing



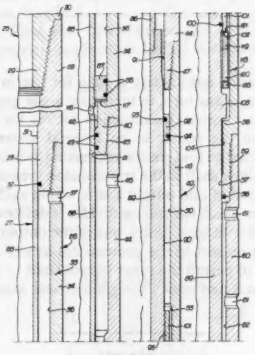
said drum to freely rotate in said second direction by the weight of said tool and without retardation by said output.

3,889,766

DEEP WELL DRILLING JAR

Wayne N. Sutliff, and Jim Downen, both of 2931 Pierce Rd., Bakersfield, Calif. 93308

Filed Apr. 4, 1974, Ser. No. 457,772
Int. Cl.[2] E21B 1/10
U.S. Cl. 175—297 **7 Claims**



1. In a deep well drilling jar, the combination of:

internal and external tubular mandrels telescopically related;

means for connecting the top end of one mandrel to a drill string and the bottom end of the other mandrel to a drill;

a jarring device embodied within said mandrels including delayed action means for striking an upward blow on the mandrel connected to said drill, said means also limiting said telescopic movement;

a spline device embodied within said mandrels including male splines formed on said internal mandrel and intermeshing female splines formed on said external mandrel; and

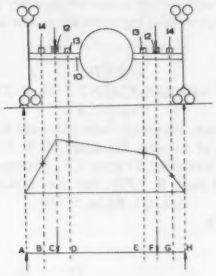
a spline retraction device embodied with said mandrels, said device being powered hydraulically from drilling liquid transmitted to said drill through said jar and automatically axially contracting the elements of said jar while said drill is being operated under a high liquid pressure to give said spline device maximum effectiveness in transmitting torque to said drill.

3,889,767

WEIGHING DEVICES

Kenneth C. Scott, London, and Alec Harry Seilly, Wembley, both of England, assignors to Simms Group Research & Development Limited, London, England

Filed Mar. 18, 1974, Ser. No. 452,072
Claims priority, application United Kingdom, Mar. 20, 1973, 13186/73
Int. Cl. G01g 19/08
U.S. Cl. 177—136 **4 Claims**



3. A weighing device for attachment to and for providing an indication of the load applied to a vehicle axle to which the load is applied at a pair of spaced points intermediate the ends of the axle, the device comprising two pairs of sensing means for mounting on the axle, one pair of sensing means being adapted to be mounted on the axle with one of said points located between the two sensing means of the one pair, the other pair of sensing means being adapted to be mounted on the axle spaced from the first pair and having the other of said points located between the two sensing means of the other pair, each of said sensing means providing an electrical signal indicative of the bending moment at its particular position, and electrical circuit means for processing said signals to provide an indication of the total load applied to the axle substantially independent of the position of the axle with respect to the horizontal.

3,889,768

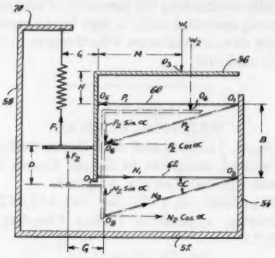
PLATFORM SCALE FOR WEIGHING A MASS INDEPENDENTLY OF THE RELATIVE POSITION OF THE MASS ON THE PLATFORM

Sid Hejzlar, Flushing, N.Y., assignor to John Chatillon & Sons, Inc., Kew Gardens, N.Y.

Filed Oct. 19, 1973, Ser. No. 407,930
Int. Cl. G01g 23/26
U.S. Cl. 177—229 **6 Claims**

1. A weighing scale of the type which has a support member for supporting objects while they are being weighed which is rigidly affixed to an associated leg member which extends downward from said support member in a vertical dimension, and check links which are pivotally associated with both said leg member and an associated support structure and are substantially parallel axially to each other and in lateral direction with respect to said leg member, are all in substantially the same directional orientation with respect to said leg member whereby said support member may move downward against a resistive force means while said vertical dimension of said leg

member is substantially uniformly retained in its vertical orientation, characterized by the facts that said support member



is affixed at one of its ends to said leg member, and that said support member effectively is in substantially the same orientation with respect to said leg member as are said check links.

3,889,769

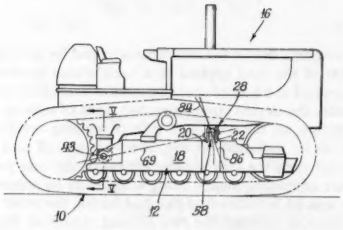
SUSPENSION ARRANGEMENT FOR A TRACK-TYPE VEHICLE

Gary D. Blomstrom, Waverly, Nebr.; Donald A. Piepho; Victor Randour, both of Aurora, Ill., and Lyle E. York, Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 9, 1974, Ser. No. 504,063

Int. Cl. B62d *55/10*

U.S. Cl. 180—9.5 **9 Claims**



1. A crawler tractor comprising:

main frame means;

first and second longitudinally-extending track frames on either side of the main frame means;

pivotal connecting means between the rearward ends of the track frames and the main frame means to allow pivotal movement of the track frames relative to the main frame means generally about a substantially horizontal axis,

a shaft mounted relative to the main frame means and positioned forwardly of and above the substantially horizontal axis, and having its longitudinal axis disposed in a plane in which said substantially horizontal axis lies;

a generally transversely extending equalizer bar defining adjacent its mid-portion a bore through which said shaft is disposed, the equalizer bar being pivotable about the longitudinal axis of the shaft and slidable therealong;

means pivotally connecting the respective ends of the equalizer bar with the track frames forwardly of the track frame and main frame means pivotal connecting means, such equalizer bar-track frame pivotal connections lying substantially along a straight line which intersects a line along which the longitudinal axis of the shaft lies;

the equalizer bar sliding along and pivoting about the longitudinal axis of said shaft during pivoting of the track frames relative to the main frame means generally about said substantially horizontal axis.

3,889,770

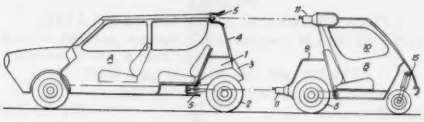
WHEELED VEHICLES

Hugh Grahame Herbert, 1B Limpsfield Ave., London, England

Filed June 20, 1973, Ser. No. 371,586

Int. Cl. B60d *1/00*

U.S. Cl. 180—14 R **2 Claims**



1. A composite vehicle comprising a major unit with a self-contained power unit driving the front wheels, and a minor unit with a self-contained power unit and rear wheel drive attachable to the back of the major unit with its driven wheels between and substantially axially aligned with the rear wheels of the major unit.

3,889,771

UNIVERSAL GAS TURBINE AUTOMOTIVE ENGINE

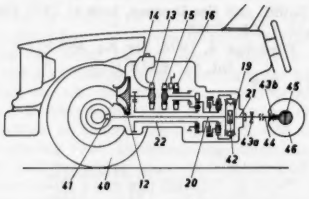
Sven Olof Kronogard, Lomma, Sweden, assignor to United Turbine AB and Co., Kommanditbolag, Malmo, Sweden

Filed May 2, 1974, Ser. No. 466,502

Claims priority, application Sweden, May 22, 1973, 7307155

Int. Cl. B60k *3/04*

U.S. Cl. 180—44 R **4 Claims**



1. In a universal automotive engine for use in driving two pairs of wheels, a gas turbine including a gas producing part and at least two rotors, transmission means for transferring power between the rotors in an integral system, a torque divider connected to said rotors and having two output shafts, at least one hollow shaft in the transmission means, and means for mounting one of said output shafts within said at least one hollow shaft, in which the torque divider is defined by a differential provided with bevel gears, one of the output shafts being displaced with respect to the geometrical axis of the adjacent pair of wheels to permit the other output shaft to pass through said hollow shaft and above the geometrical axis of said pair of wheels.

3,889,772

TAIL PIPE SYSTEM

Charles N. Kelley, Dallas, Tex., assignor to Harold Schnair, Delta Quality, Dallas, Tex.

Filed Nov. 21, 1973, Ser. No. 417,899

Int. Cl.[2] B60K *13/04*

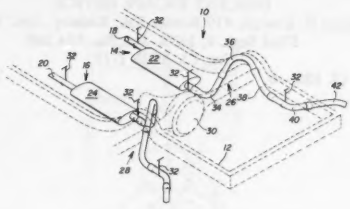
U.S. Cl. 180—64 A **8 Claims**

1. A motor vehicle tailpipe for use in conveying exhaust gases from a point located to the front of the rear axle up over and to a point to the rear of the rear axle, comprising in combination:

a first portion of curved conduit having a first end for extending from a point to the front of the rear axle and a second end extending at an obtuse angle with respect to said first end in a direction toward the rear axle;

a second portion of curved conduit for extending from the first portion vertically up over the rear axle a sufficient height to clear movement of the rear axle with respect to the frame to a point to the rear of the rear axle, said second portion having a first end for connection to said second end of said first portion with the second end of said second portion extending at an acute angle with respect to said first end of said second portion;

a third portion of curved conduit for extending to the rear of said rear axle, said third portion having a first end for connection to said second end of said second portion with



the second end of said third portion extending at an obtuse angle with respect to the first end of said third portion; and

enlarged ends formed on said portions releasably connecting said second end of said first portion to said first end of said second portion in a gas-tight telescoping joint and releasably connecting said second end of said second portion to the first end of said third portion in a gas-tight telescoping joint, whereby the relative angular extension of said first end of said first portion with respect to the second end of said third portion can be selectively varied.

3,889,773

DRIVE DISCONNECT FOR MOTORIZED WHEELCHAIR

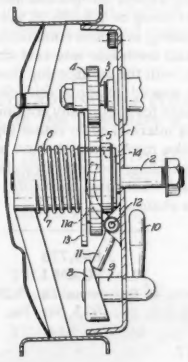
John Bernard Chant, Alton, England, assignor to Vessa Limited, Alton, England

Filed Feb. 5, 1974, Ser. No. 439,750

Claims priority, application United Kingdom, Feb. 5, 1973, 5640/73

Int. Cl. B60k *1/00*

U.S. Cl. 180—65 R **4 Claims**



1. An electrical driving unit for a wheel or a wheel chair comprising a mounting plate attached to a fixed wheel axle and carrying an electric motor whose output shaft passes through the said plate, a gear mounted on the said shaft and normally meshed with a gear axially slidable over a key in a wheel hub freely rotatable on the said axle and wherein manually operable means passing through the said plate is actuable to slide the said axially slidable gear over the said key so as to disconnect it from the gear on the said output shaft.

3,889,774

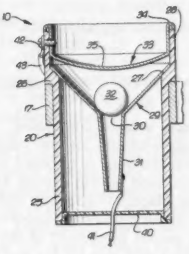
ACCIDENT RESPONSIVE AUTOMATIC IGNITION CUT-OFF SWITCH

George B. Schwenk, 7711 Deer Trail, Yucca Valley, Calif. 92284

Filed June 24, 1974, Ser. No. 481,998

Int. Cl. B60r *21/00;* **H01h** *35/02*

U.S. Cl. 180—104 **1 Claim**



1. A safety electric switch for shutting off the engine of an automotive vehicle in the event said vehicle is canted in any direction more than a specific maximum angle from its normal upright position, said switch comprising:

a cylindrical dielectric switch housing having a vertical bore, an upper end portion of which housing is enlarged in both its outside and inside diameters to provide an internal counter bore terminating at its lower end in an inwardly bevelled annular shoulder facing upwardly and providing an outside downwardly facing annular shoulder;

a lowr steeply conically concave metalic switch contact member the peripheral portion of which rests on and is cemented to said inwardly bevelled annular shoulder;

an upper shallowly concave metallic switch contact member, comprising the bottom of a cylindrical wall which snugly fits downwardly into said counter bore and has an external annular flange overlying and engaging the top end of said switch housing, said members being thus coaxially related with each other and with said bore; and

a metal ball resting normally upon and in centered relation with said lower contact member and out of contact with said second contact member, said ball automatically rolling out of its centered relation with said lower contact member and into contact with said upper contact member when said switch is canted from its normal upright position in any direction more than said specific maximum angle;

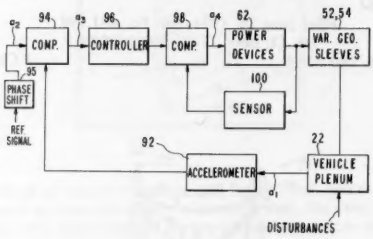
bracket means for mounting said switch up rightly upon said vehicle with the axis of said bore vertical when said vehicle is in normal upright position said means including a ring fitting the lower portion of said housing and flush with said outside annular shoulder of said housing whereby said switch is supported by said ring; and

means for interposing said switch in the igniton circuit of said engine so as to shut off said engine when said switch is closed by said ball simultaneously engaging both of said contact members.

3,889,775
SURFACE EFFECTS VEHICLE HAVING VARIABLE GEOMETRY LIFT FAN

Werner P. Luscher, El Dorado Hills, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Filed Nov. 12, 1973, Ser. No. 415,082
Int. Cl. B60v 1/04
U.S. Cl. 180—118 19 Claims

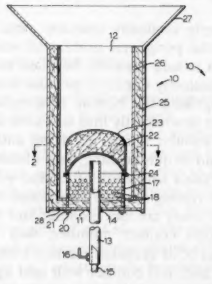


1. A surface effects vehicle comprising: a body having means defining an open-bottom plenum adapted to be substantially closed when the body is disposed on a surface; an actuatable, centrifugal type lift fan carried by the body and having a fluid passage adapted to direct air under pressure into said plenum to form an air cushion to support the same above said surface and to permit movement of the body over the surface; means coupled with said lift fan and movable across said fluid passage for causing a change in the volume rate of flow of air therethrough when the lift fan is actuated; and means coupled with said lift fan for actuating the same.

3,889,776
EXHAUST GAS SILENCER

Peter Postma, Fort Saskatchewan, Canada, assignor to Sherritt Gordon Mines Limited, Toronto, Canada

Filed Aug. 21, 1973, Ser. No. 383,226
Claims priority, application Canada, June 14, 1973, 174021
Int. Cl. F01n 1/10
U.S. Cl. 181—50 10 Claims

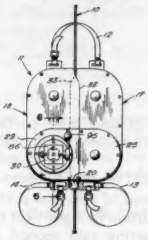


1. An open end gas exhaust silencer comprising an elongated hollow baffle casing having a fully open end and a closed end, an inlet conduit secured to said closed end of said baffle casing and having an end portion therein extending into said baffle casing through said closed end, said inlet conduit being operative to be connected to a noisy gas exhaust pipe having an exhausted gas releasing therefrom in a high velocity, a hollow cylinder located in said baffle casing and coaxially encircling said end portion of said inlet conduit in a spaced relation therewith, the side wall of said hollow cylinder being entirely full of perforations, a filter cap member removably mounted on said hollow cylinder and disposed transversely and directly opposite to the end opening of said inlet conduit, said filter cap in combination with said hollow cylinder defining a space considerably smaller than the remaining hollow space in said baffle casing, a porous element mounted in said filter cap member operative for dividing the exhausted gas into a plurality of random gas streams so as to reduce the velocity of the exhausted gas whereby eliminating the noise in said exhausted gas, and a lining of sound absorbing material disposed on all inside walls of said hollow baffle casing for absorbing any remaining noise in said random gas streams.

3,889,777
DESCENT ESCAPE DEVICE

Clarence E. George, 419 Reeder Rd., Kleberg, Tex. 75145

Filed Sept. 9, 1974, Ser. No. 504,268
Int. Cl. A62b 1/14
U.S. Cl. 182—6 7 Claims



1. A personal escape device for coupling to a suspended cable comprising

a generally flat housing including two side-by-side housing parts separable along a generally vertical parting joint; said housing being hinged at one end of said parting joing, and having latch means at the other end of said parting joint for closing the housing; means on said housing for strapping said housing to the body of a person;

an endless chain of pivotally connected teeth supported in each housing part on at least two chain sprockets; each endless chain comprising teeth with convex and concave projecting tabs connected alternately in closely spaced relation;

said housing, in closed condition, providing confronting walls defining a linear upright channel at the parting joint, said channel being of a width to accommodate a cable; and said housing, in closed condition, guiding said chains to project said teeth tabs into said channel in intermeshing relation, with the confronting faces of the intermeshing tabs in spaced relation; said chain tabs defining a sinusoidal path for frictionally confining a cable; and said chains being interlocked to rotate together;

adjustable brake means mounted on at least one housing part, for controlling the rate of rotation of at least one of said chain sprockets and, therefore, the rate of drive of said endless chains.

3,889,778
PLATFORM LIFT

Gerald Dean Dotts, 41 Brentwood Dr., Stillwater, Okla. 74074

Filed July 26, 1973, Ser. No. 382,754
Int. Cl. E04g 1/22
U.S. Cl. 182—17 15 Claims

1. A vertically adjustable work platform, comprising:

a. base structure means of rectangular configuration adapted to be used in a substantially horizontal plane;

b. top work platform means of rectangular configuration substantially parallel to said base means;

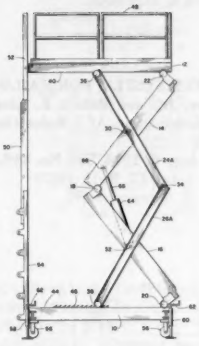
c. a pair of rectangular tubing structural members each of length L, hinged together at one end in a vertical plane,

the second end of the lower member hinged to a first end of said base means, the second end of the upper member hinged to a first end of said platform means;

d. a first pair of channel struts of length L, one on each side of said lower member, rotatable about a transverse shaft through said lower member at the midpoints of said member and said struts;

e. a second pair of channel struts of length L, one on each side of said upper member rotatable about a transverse shaft through said upper member at the midpoints of said member and said struts;

f. the first ends of each pair of struts hinged together;



g. roller means attached to the second ends of said struts, those on the lower pair of struts adapted to roll along the top surface of said base means, and those on the upper pair of struts adapted to run on the underside of said platform means;

h. hydraulic cylinder and piston means connected between said two hinged members; and

i. ratchet means between said base means and the second ends of said lower pair of struts; and including cable means wound around pulley means on selected ones of the shafts forming the hinges for said struts, and means responsive to said cable means for operating said ratchet means to permit lowering said platform under control of said hydraulic cylinder and piston means.

3,889,779

LENGTH ADJUSTABLE PLANK

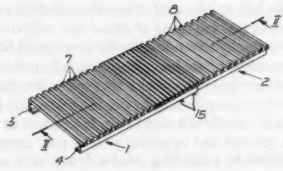
Walter Kümmerlin, In Den Fressackern 6, 7120 Bissingen, Enz, Germany

Filed Oct. 15, 1974, Ser. No. 514,769

Claims priority, application Germany, Oct. 23, 1973, 2352949; Mar. 13, 1974, 2411951

Int. Cl. E04g *5/08*

U.S. Cl. 182—223 **16 Claims**



1. A length adjustable plank, comprising

at least two parts, including a first part and a second part, adjustably disposed relative to each other in a longitudinal direction thereof,

each of said parts comprises two longitudinal beams constituting profile rods arranged parallel and spaced from each other, and transverse beams having upper surfaces and forming a standing surface for a user, said transverse beams covering at least partially on top of said longitudinal beams and operatively connecting the latter to each other,

said longitudinal beams of said two parts, respectively, forming cooperatively a longitudinal guide, said longitudinal beams of said second part being guided between said longitudinal beams of said first part, said longitudinal beams of said first part constituting outer disposed longitudinal beams and said longitudinal beams of said second part constituting inner disposed longitudinal beams,

the length of said transverse beams of said first part on top of said outer disposed longitudinal beams being equal to the width of the plank,

the length of said transverse beams of said second part on top of said inner disposed longitudinal beams being a little smaller than the open spacing between said outer disposed longitudinal beams,

securing means for releaseably fixing said inner disposed longitudinal beams in position relative to said first part in a use condition of said plank such that said transverse beams, respectively, of said second and first parts, respectively, on top of said inner and outer disposed longitudinal beams, respectively, mesh with one another, in a manner that the upper surfaces of said transverse beams, respectively, lie substantially in a common plane.

3,889,780

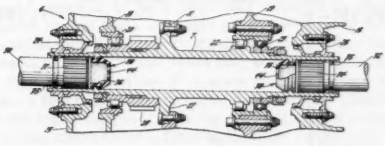
GREASE RETAINER FOR ENGAGED SPLINES

James R. Dison, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 9, 1974, Ser. No. 504,031

Int. Cl. F01m *9/00*

U.S. Cl. 184—1 R **4 Claims**



1. An accessory drive installation comprising a gear box, a hollow drive shaft mounted in the gear box for rotation about the shaft axis, an accessory device mounted on the gear box having a connecting shaft with external splines, the drive shaft having internal splines mating with the said external splines, and means for retaining grease packed in the splines comprising an elastomeric plug mounted in the shaft and having a circumferential tongue and groove locating connection with the shaft, the plug being yieldable for insertion of the plug.

3,889,781

FIXTURE FOR CABLE LUBRICATING DEVICE

Roger A. Schott, 13559 Rutland, Detroit, Mich. 48227, and Lawrence A. Schott, 15940 Warwick, Detroit, Mich. 48223

Filed May 4, 1973, Ser. No. 357,225

Int. Cl. F16n *11/00*

U.S. Cl. 184—15 R **4 Claims**

1. A fixture for a cable lubricating device which comprises:

a. a body portion formed as an extruded part having a base, a side wall, and a cap portion and an internal recess having a curved portion at the base and a relatively flat portion at the

top, said recess opening at one side, and one or more locator openings extending radially from said recess,

b. a resilient insert to lie in said recess against the base having a projection to interfit with a locator opening, said insert having a central bore extending axially thereof to receive the end of a cable sheath and a cable, and an axially extending radial cleavage to said bore,

c. an axially extending rod-like, integral protrusion along one side of said insert opposite said projection,

d. a clamping plate in said recess opposite said curved portion to move in said recess toward and away from said insert and having an axially extending recess to capture said rod-like protrusion, and

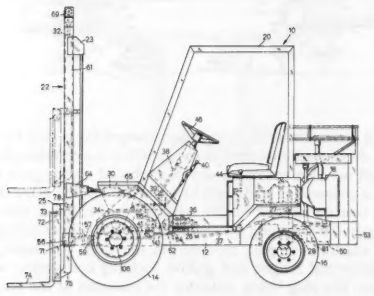
e. means to move said plate to compress said insert and close said insert around an encircled sheath and cable.

3,889,782

MATERIAL HANDLING VEHICLE HAVING HIGH GROUND CLEARANCE POWER TRANSMISSION AND WHEEL SUPPORT MEANS

Warren P. Geis, Port Washington, Wis., assignor to Koehring Company, Milwaukee, Wis.

Filed June 11, 1973, Ser. No. 369,008
Int. Cl.[2] B66B 9/20; B60K 17/00
U.S. Cl. 187—9 **11 Claims**



1. In a self-propelled material handling vehicle:

a chassis,

material handling apparatus mounted on said chassis and including a mast and a lift unit vertically movable on said mast, the bottom of said mast being disposed above the bottom of said chassis and said lift unit being movable into and out of a position below the bottom of said chassis,

a propulsion unit mounted on said chassis,

a pair of ground wheels located outwardly of and on opposite sides of said chassis behind said apparatus,

an axle for each ground wheel extending outwardly and beyond a side of said chassis,

and means for supporting said axles and for delivering motive power thereto from said propulsion unit, said means comprising an inverted U-shaped hollow rigid housing having an intermediate portion transversely disposed above the bottom of said chassis and a pair of end portions depending downwardly on the sides of said chassis below the bottom of said chassis, each end portion having an inner side and an outer side,

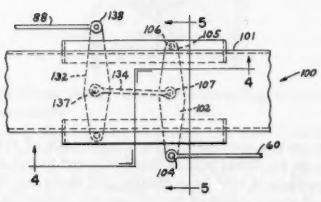
each end portion being rigidly connected on its inner side to said chassis and supporting an axle, said means further comprising power transmission means disposed within said housing for transmitting motive power from said propulsion unit to said axles.

3,889,783

BRAKE LEVER SYSTEM FOR RAILWAY CARS

Edward H. Sittner, Jr., and Robert R. Girard, both of St. Charles, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Aug. 8, 1974, Ser. No. 495,887
Int. Cl. B61h 13/20
U.S. Cl. 188—52 **8 Claims**

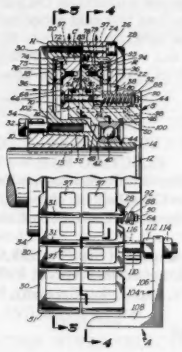


1. A railway freight car brake system comprising: a railway car having a longitudinally extending center sill; a brake cylinder mounted upon said car having a piston extending therefrom connected to a first transverse extending lever; said first transverse lever connected to a first longitudinally extending brake lever which acts to apply the brakes to a first end of said car; said first transversely extending brake lever being connected at about its midpoint to a second longitudinally extending brake lever extending in a direction opposite to said first longitudinally extending brake lever; said second longitudinally extending brake lever engaging a second transversely extending brake lever about the midpoint thereof; said second transversely extending brake lever being fulcrumed to the car body at one end thereof and the other end thereof being connected to a third longitudinally extending brake lever; said third longitudinally extending brake lever engaging a third transversely extending brake lever which passes through an opening in said center sill and which is fulcrumed to a first web of said center sill at one end thereof, said third transversely extending brake rod engaging at about the midpoint thereof a fourth longitudinally extending brake lever, said fourth longitudinally extending brake lever engaging a fourth transversely extending brake lever at about the midpoint thereof, said fourth transversely extending brake lever passing through an opening in said center sill and being fulcrumed at a first end thereof to a second and opposite web of said center sill; said fourth transversely extending brake lever at a second end portion engaging a fifth longitudinally extending brake lever, said fifth longitudinally extending brake lever acting to apply the brakes at a second end of said railway car.

3,889,784
INTERNAL CALIPER BRAKE

James V. Hanks, Minneapolis, Minn., assignor to Horton Manufacturing Co., Inc., Minneapolis, Minn.

Filed Feb. 28, 1974, Ser. No. 446,647
Int. Cl. F16d *55/04*
U.S. Cl. 188—71.4 **3 Claims**

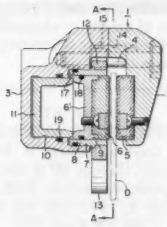


1. An internal caliper brake comprising:
a. a rotor portion including an annular support for securement to a shaft to be braked,
b. said annular support mounting an annular U-shaped housing having a radially extended first disc portion, an annular base wall and a second disc portion spaced from said first disc portion which forms
c. a U-shaped annular cavity having spaced opposed friction surfaces in the form of said first and second disc portions,
d. a stator portion including an annular base member having
e. means for mounting
f. a first annular piston within said cavity, said mounting means for the piston including an annular flange on said annular base member upon which said piston is slidable,
g. said first piston carrying an annular flange overlying said mounting means to form
h. an annular cylinder within said annular cavity,
i. a second annular piston mounted in said cylinder,
j. means for normally urging said pistons together which includes an annular flange formed on the inner annular edge of said second piston,
k. said flange of said second piston having a multiplicity of holes therethrough,
l. said first piston includes an annular flange formed on the inner annular edge,
m. said inner flange of said first piston having a multiplicity of holes,
n. said annular flange of said annular base member having a multiplicity of holes,
o. a pin mounted in the holes of said flanges of said pistons and the holes of said annular flange of said annular base member,
p. shoulder means formed on the outer end of each of said pins,
q. a coil spring mounted on each of said pins between said shoulder means and said flange of said second piston to normally thereby urge the pistons together,
r. friction means carried by each of said pistons for engagement with the opposed friction surfaces of said U-shaped cavity,
s. means rotatably mounting said rotor on said stator including a bearing mounted between said annular base member of said stator and said annular support of said rotor,
t. means for maintaining said stator stationary,
u. means for mounting said annular support of said rotor on a shaft to be braked,
v. means carried by said annular housing for dissipating heat from the brake through the annular cavity and out said annular housing including a multiplicity of holes formed in said first disc portion of said annular housing,
w. a multiplicity of holes formed in said second disc portion of said annular housing,
x. a multiplicity of holes formed in said annular base wall of said annular housing,
y. fins mounted on said first disc portion, said second disc portion and said annular base wall,
z. said friction means of said pistons having grooves therein whereby upon a braking of the device air passes inwardly of said holes in said first and second disc portions, through said grooves of said friction means and out said holes of said annular base wall of said annular housing.

3,889,785
DISC BRAKE UNIT

Toshio Hori, 1009-2 Ohoza Lokiie, Ueda, Japan

Filed Feb. 13, 1974, Ser. No. 442,149
Claims priority, application Japan, Feb. 16, 1973, 48-18345
Int. Cl. F16d *55/224, 65/02*
U.S. Cl. 188—73.3 **1 Claim**



1. A disc brake unit comprising: a brake disc secured to a rotating member; caliper means having a pair of caliper arms spaced opposite to each other and arranged in straddling relation to said brake disc, said caliper arms being interconnected at their basal ends by means of joining bolts extending parallel to an axis of said brake disc, said bolts being exposed at their medial portions to a space defined by said caliper arms; a first friction pad mounted on one of said caliper arms on the inside thereof and facing one face of said brake disc; a bearing sleeve slidably fitted in the other caliper arm on the inside thereof; a second friction pad slidably fitted in said bearing sleeve to face the other face of said brake disc; a bracket plate formed at the outer end of said bearing sleeve and integrally therewith, said bracket plate being slidably engageable with the exposed medial portions of said joining bolts; a fixed frame, said bracket being attachable to said fixed frame; and thrust means including a hydraulic cylinder bore formed within one of said caliper arms substantially in coaxial relation with said bearing sleeve, and a piston member slidably in said cylinder bore so as to drive said second friction pad into pressure engagement with said brake disc free of contact with the inner surface of said sleeve.

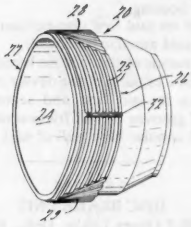
3,889,786
BRAKE DRUM COOLING STRUCTURE

Carl N. Schrader, Detroit, Mich., and Frank H. Fisher, Kenton, Ohio, assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed June 28, 1973, Ser. No. 374,326
Int. Cl. F16d *65/10*
U.S. Cl. 188—218 R **5 Claims**

1. A metal brake drum comprising a cast generally cylindrical main body portion open at one axial end thereof and

provided with means for mounting the drum to a wheel assembly at the other end, the interior of said main body portion comprising a cylindrical friction braking surface, the exterior of said main body portion having a plurality of radially extending heat radiating projections integrally cast and formed from the same metal as said main body portion adjacent the open end thereof, said radially extending projections comprising a



plurality of circumferentially spaced sets of helical fins with each successive set of helical fins comprising a plurality of helically oriented radial projections disposed at a helical orientation opposite to the helical orientation of the projections comprising the preceding set and a plurality of circumferentially spaced groups of axially or circumferentially extending ribs with each set of helical fins separating a pair of circumferentially spaced groups of said ribs.

3,889,787

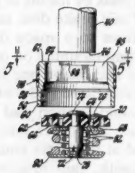
HYDRAULIC SHOCK ABSORBER UNIT

Robert B. Zehring, Dayton; Richard W. Kinninger, Arcanum, and Allan W. Miller, Dayton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 5, 1973, Ser. No. 404,102

Int. Cl. F16f *9/19*

U.S. Cl. 188—317 **1 Claim**



1. In a piston and piston rod subassembly for disposition in a shock absorber pressure chamber filled with a hydraulic working fluid, said subassembly including a piston slidably disposed in said pressure chamber and dividing the latter into a jounce compression chamber and a rebound compression chamber, said piston having a jounce compression surface and a rebound compression surface exposed to respective ones of said jounce and said rebound compression chamber, valve means on said piston operative to control fluid flow across said piston between said jounce and said rebound compression chambers, and a cylindrical piston rod of predetermined diameter slidably disposed on said shock absorber and projecting into one of said jounce and said rebound compression chambers, the improvement comprising, means on said piston defining a slot extending between said valve means and said one of said jounce and said rebound compression chambers, said slot intersecting the corresponding one of said jounce and said rebound compression surfaces and defining thereat an elongated aperture of width less than said predetermined piston rod diameter and of length exceeding said predetermined piston rod diameter, and means rigidly connecting said piston and said piston rod at said corresponding one of said jounce and said rebound compression surfaces with the longitudinal axis of said piston rod intersecting the geometric center of said elongated aperture so that said piston rod overlaps the edges of said elongated aperture thereby to close a portion of said slot, said piston rod cooperating with said elongated aperture in defining a pair of laterally spaced flow ports on said piston.

3,889,788

OVERHEAD CURRENT SUPPLY EQUIPMENT FOR ELECTRIC RAILWAYS

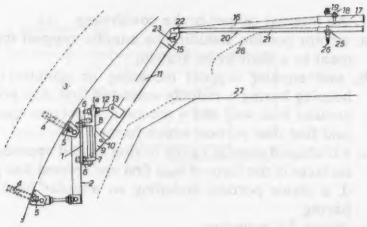
Joseph Littler, Huyton; Dennis Joseph Taylor, Ormskirk, and Kenneth James Campbell, St. Helens, all of England, assignors to British Insulated Callender's Cables Limited, London, England

Continuation-in-part of Ser. No. 139,681, May 3, 1971, abandoned. This application Apr. 9, 1973, Ser. No. 349,551

Claims priority, application Germany, May 6, 1970, 21815

Int. Cl. B60m *1/20*

U.S. Cl. 191—40 **14 Claims**



1. In overhead current supply equipment of an electric railway, comprising at least one overhead wire that passes through an overhead structure an insulating support comprising a substantially rigid base secured to said overhead structure and located to one side of the vehicle load gauge, a single simple inclined strut extending upwards and inwards to a point higher than the highest point of the load gauge and being secured to said base to inhibit rotation about a horizontal axis, a resin-bonded glass fibre beam providing insulation for the support and extending inwards from the upper end of the said strut and being secured to it to inhibit rotation about a horizontal axis, and a fitting securing said overhead wire to the free end of said beam.

3,889,789

THERMAL FUSE MECHANICAL DISCONNECT

Wilfred E. Boehringer, Fullerton, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Apr. 15, 1974, Ser. No. 460,920

Int. Cl. F16d *11/00*

U.S. Cl. 192—82 T **10 Claims**

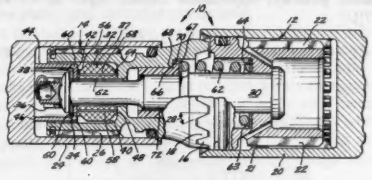
1. Torque disconnect means including:

first means for connecting to torque supplying means;

second means for connecting to torque receiving means; and

third means for connecting and disconnecting said first and second means in torque transmitting relationship, said third means including bias means tending to force said first and second means to disconnect positions and a thermal fuse loaded in compression by said bias means, said thermal fuse including a body having opposite paral-

lel abutment faces to which said bias means apply the compressive load, said thermal fuse body being constructed of fuse material which remains solid up to a predetermined temperature and a plurality of columnar supporting members which extend perpendicular to and between said abutment faces, whereby said fuse material



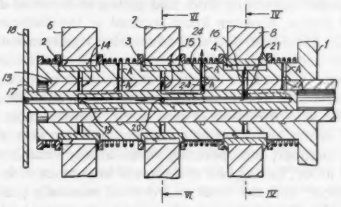
prevents columnar bending of said supporting members until the predetermined temperature is reached, at which time the compressive load fails said supporting members in columnar bending so that said thermal fuse no longer resists said bias means, thereby allowing said bias means to disconnect said first and second means.

3,889,790

GEAR CLUTCHES WITTH SELECTOR VALVE

Norman C. Bricker, Courtenay, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Aug. 8, 1973, Ser. No. 386,760
Int. Cl. F16d *25/10*
U.S. Cl. 192—85 AT **2 Claims**



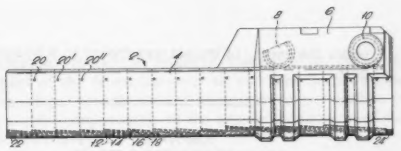
1. A transmission system, comprising
a substantially tubular drive shaft having a plurality of spaced keys mounted thereon;
a driven shaft in operative proximity with the drive shaft and positioned substantially in parallel therewith;
a plurality of spaced annular drive gears coaxially freely positioned around the drive shaft, each of the drive gears being positioned in operative proximity with a corresponding one of the keys;
a plurality of spaced driven gears mounted on the driven shaft and rotatable therewith, each of the driven gears being drivingly coupled to a corresponding one of the drive gears;
a transmission case; and
control means in the drive shaft for selectively moving each of the keys into and out of engagement with the corresponding drive gears, the control means comprising
a sleeve having a plurality of valve holes formed therethrough coaxially positioned inside the drive shaft, each hole corresponding in position to a corresponding one of the keys, and a pressure tube coaxially positioned inside the sleeve, said pressure tube being affixed at one end to the transmission case and having a plurality of holes formed therethrough and oil under pressure therein, each hole of the pressure tube corresponding in position to a corresponding hole of the sleeve, and rotating means for selectively rotating the sleeve to align a desired hole of the sleeve with a desired hole of the pressure tube for selectively urging a desired one of the keys into engagement with the corresponding drive gear thereby rotating the drive gear with the drive shaft.

3,889,791

CHARGE DISTRIBUTION CHUTE

Edouard Legille, Luxembourg, and Rene N. Mahr, Howald-Hesperange, both of Luxembourg, assignors to S.A. des Anciens Etablissements Paul Wurth, Luxembourg

Filed June 27, 1973, Ser. No. 374,049
Claims priority, application Luxembourg, July 7, 1972, 65680
Int. Cl. B65g *11/16*
U.S. Cl. 193—3 **2 Claims**



1. A charge distribution chute for use within a blast furnace comprising:
a rigid elongated support channel defining body comprised of heat resistant steel; and
a plurality of wear-resistant members rigidly affixed to and detachable from the interior channel defining surface of said body, said wear-resistant members being individually affixed in overlapping relationship to said body only adjacent their respective upstream ends in the direction of charge material flow of said members, said wear-resistant members each including at least a first carrier plate comprised of heat-resistant steel and a layer of abrasion-resistant material affixed to the carrier plate on the material contacting side of the wear-resistant member, said wear-resistant members being shaped to define a channel at least partly commensurate in shape with the channel defined by said body whereby material flowing along the chute will be contained by and in contact with said wear-resistant members to a preselected depth, at least two of said wear-resistant members being superimposed at all points along the channel defining body located downstream of the wear-resistant member positioned at the material receiving upstream end of the chute.

3,889,792

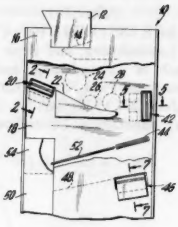
ENERGY ABSORBING DEVICE FOR COIN HANDLING MECHANISMS AND THE LIKE

Frederick Gordon Willis, Winchester, Mass., assignor to Mars, Inc., McLean, Va.

Filed May 8, 1974, Ser. No. 468,205
Claims priority, application United Kingdom, May 18, 1973, 23883/73
Int. Cl. G07f *3/02*
U.S. Cl. 194—1 K **8 Claims**

1. A device in a coin apparatus for abruptly stopping the motion of a coin along its path of travel comprising
a strike plate,
a support for the strike plate positioning the plate in the path of the coin to intercept its travel,
a first cushion layer contiguous to and interposed between the strike plate and support to be compressed by and to

yield under impact of the coin with the strike plate, and a mounting for the support adapted to yield resiliently



under the energy of impact transmitted to it by said support.

3,889,793

MOSAIC PRINTING HEAD

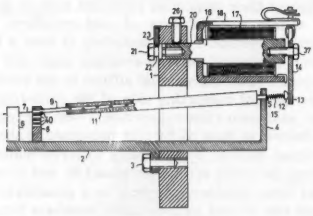
Sergio Cattaneo, Voghera, Italy, assignor to Honeywell Information Systems Italia, Caluso, Italy

Filed June 14, 1973, Ser. No. 370,136

Claims priority, application Italy, June 15, 1972, 25698/72

Int. Cl. B41j *3/05*

U.S. Cl. 197—1 R **7 Claims**



1. A printing head for a mosaic printer wherein a plurality of movable needles are projected against a platen, said printing head comprising a ring-shaped structural supporting member, a bracket firmly connected to said ring-shaped member, said ring shaped member having a plurality of axial openings distributed circumferentially with respect to said bracket; a plurality of guiding members for said movable needles mounted on said bracket; a plurality of flat electromagnets, each electromagnet comprising a rotatable armature, a central core, a U-shaped yoke and a cylindrical projection coaxial to said central core and engaged in a corresponding one of said axial openings of said ring-shaped member; each cylindrical portion and its respective axial opening defining individual means for mounting a respective one of said electromagnets in axially adjusted position; individual locking means for locking each said electromagnet in the adjusted position; individual means for adjusting the air gap between said armature in rest position and said central core; and means for securing said armature to said yoke in a manner allowing a limited rotation of said armature substantially free from restoring torques.

3,889,794

TYPEWRITER PLATEN RELEASING MECHANISM HAVING AN ELASTICALLY DEFORMABLE GEAR DISC

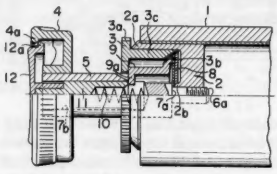
Toshikatu Terashima, Sakaki-Machi, Japan, assignor to Nakajima All Kabushiki Kaisha, Tokyo-To, Japan

Filed Nov. 28, 1973, Ser. No. 419,723

Claims priority, application Japan, Apr. 2, 1973, 48-38727[U]

Int. Cl. B41j *19/80*

U.S. Cl. 197—123 **6 Claims**



1. A releasing mechanism for a cylindrical platen of a typewriter, the typewriter further including a line changing mechanism, the releasing mechanism comprising, in combination: a boss secured in the interior of said platen at one end thereof; a platen gear rotatably and coaxially inserted in said boss and having means forming an opening with inner, first gear serrations at the axially inner end thereof, and a ratchet wheel on the outer circumference and at the axially opposite end thereof, for driven engagement with said line changing mechanism; a platen arbor having the axially inner end rigidly secured to a central portion of said boss, and the other end extended outwardly from said platen in the axial direction of said platen; a platen knob secured to the outer end of said arbor; a resilient, disc-shaped member rigidly mounted on said arbor and having second gear serrations on the outer circumference thereof for meshing engagement with said first gear serrations; a sleeve member mounted on said arbor, slidable in the axial direction of said arbor, non-rotatable relative to said arbor, and abutting a radially outer portion of said resilient member; and operating means axially slidably mounted in said arbor, having one end thereof in contact with said sleeve member, and the other end thereof manually pushable from outside; the manual pushing operation on said operating means causing said sleeve member to deform said resilient member in a manner that said second gear serrations move out of meshing engagement with said first gear serrations, whereby driving connection between said gear and said platen is broken.

3,889,795

REMOVABLE CARTRIDGE FOR THE INKED RIBBON FOR TYPEWRITERS, CALCULATING MACHINES OR OTHER OFFICE MACHINES

Sergio Garberi, and Lorenzo Bertino, both of Ivrea, Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea(Torino), Italy

Filed Oct. 20, 1972, Ser. No. 299,379

Claims priority, application Italy, Dec. 6, 1972, 70,460/71; Dec. 30, 1972, 68,360/72

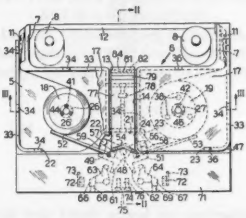
Int. Cl. B41j *33/14*

U.S. Cl. 197—151 **17 Claims**

1. A removable cartridge for an inked ribbon for an office printing machine of the type including a supporting platform, two motive shafts rotatably projecting from said platform, a ribbon reversal feed mechanism including two sensing elements for rotating one or another of said two motive shafts in one predetermined sense of rotation, a closure plate including a central tongue, an engaging tongue projecting from said platform, said closure plate being fulcrumed on said platform between an inoperative location and an operative location for causing said central tongue to engage said engaging tongue in

correspondance with said operative location of said closure plate, and means connecting said closure plate with said two sensing elements for moving said sensing elements from inoperative positions away from said motive shafts in correspondence with said inoperative location of said closure plate of operative positions of said sensing elements near said motive shafts, in correspondence with said operative location of said closure plate, said cartridge comprising

a. a container including a main wall, a series of side elements connected to said main wall perpendicular to said main wall, two ribbon spools, means rotatably supporting said spools in lateral spaced relation within said container about an axis perpendicular to said main wall, means for accomodating said motive shafts concentrically with said spools, and an inked ribbon having ends fixed to said spools and wound in coils on said spools, one of said side



elements defining a pair of slits for the passage of said inked ribbon from the one to the other of said spools outside said container, and said spools being provided with corresponding engaging means for engaging said motive shafts;

b. aperture means on said container for causing said sensing elements during the movement thereof from said inoperative positions to said operative positions to bear against said coils of ribbons wound on said spools, and sense the amount of coils of ribbon wound on said spools; and

c. first means defining a recess between said two spools in said main wall for cooperating with said tongue of said closure plate in correspondence with the operative location of said closure plate for fixing said container on said platform jointly to the bearing of said sensing elements against said coils.

3,889,796

HARVESTER BOOM CONTROL

Everett M. Baily, Moscow, Idaho; Donald E. Rathbone, Manhattan, Kans., and Lynn F. Johnson, Omer Falls, Idaho, assignors to Idaho Research Foundation, Inc., Moscow, Idaho

Filed Jan. 24, 1974, Ser. No. 436,201
Int. Cl. B65g *43/00*

U.S. Cl. 198—7 **6 Claims**

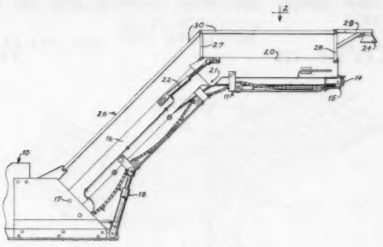
1. A control for a boom conveyor adapted to be pivoted about a horizontal axis and including a discharge end spaced from said axis for delivering material from said discharge end downward onto a receiving pile in a receptacle, comprising:

ultrasonic transducer means pivotally mounted at the discharge end of the conveyor boom for continuously monitoring the spacing between the discharge end and the upper surface of the receiving pile and for producing an output signal indicating the spacing between the discharge end and the upper surface of the pile;

drive means for raising or lowering the discharge end of the conveyor relative to the surface of said receiving pile;

output signal translating means operatively connecting said ultrasonic transducer means and said drive means, said output signal translating means being responsive to said output signal of the ultrasonic transducer means for operating said drive means to continuously maintain the spacing between the discharge end and the upper surface of said receiving pile at a preselected distance; and

means operatively interconnecting the ultrasonic transducer means and the boom conveyor for pivoting the



ultrasonic transducer means in response to pivotal movement of the boom conveyor to maintain the ultrasonic transducer means directed toward the upper surface of the pile independently of the angular orientation of the boom conveyor.

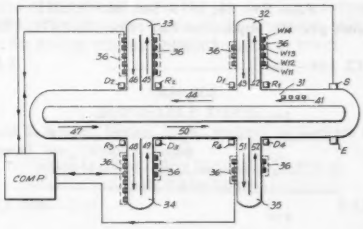
3,889,797

AUTOMATIC TRANSPORT SYSTEM

Kazuo Naito, 11, Kawada-cho, Ichigaya, Shinjuku-ku, Tokyo; Terumitsu Kondo, 8-2, Nishi-5-chome, Yachiyodai, Yachiyoshi, Chiba-ken, and Kansuke Nakajima, 2-3, Takanedai-cho, Funabashi-shi, Chiba-ken, all of Japan

Filed Dec. 29, 1972, Ser. No. 319,858
Claims priority, application Japan, Dec. 29, 1971, 47-711
Int. Cl. B65g *59/06*

U.S. Cl. 198—35 **3 Claims**

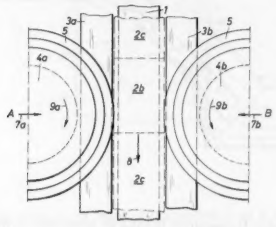


1. An automatic transport system comprising a main conveyer for transporting containers each with a plurality of pallets stacked therein and on which are loaded workpieces to be processed, a plurality of sub-conveyers disposed along said main conveyer in predetermined spaced relation for transporting said pallets delivered from said containers at an intersection location of said two conveyers and for returning the pallets back to the main conveyer after the workpieces have been processed along said sub-conveyer, and means for transporting said pallets from main conveyer to the sub-conveyers, said means including a first positioning means for positioning and stopping said containers on the main conveyer, pushing means for pushing the pallets stacked in the containers stopped by said positioning means one by one so as to transfer the pallets to the sub-conveyers and second positioning means for effecting a stopping operation of a proceeding container at the outlet end of the sub-conveyer to stack the pallets loaded with the processed workpieces therein.

3,889,798
DEVICE FOR TRANSPORTING BARS

Heinz Jurgens, Unna, and Heinrich Ostendorf, Dortmund, both of Germany, assignors to Brown, Boveri & Cie AG, Mannheim, Germany

Filed Jan. 15, 1974, Ser. No. 433,521
Claims priority, application Germany, Jan. 16, 1973, 2301929
Int. Cl. B41j *13/00*
U.S. Cl. 198—127 **1 Claim**

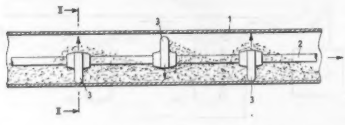


1. Means for transporting bars or bar sections, on slideways, in their longitudinal direction comprising driven friction wheels which are arranged alongside and acting on said bars, said wheels having radial circular slots at their periphery, and means to compensate for uneven pressure of said wheels on said bars and prevent the bars from tilting, comprising lateral guide bars mounted in said slots, said guide bars being located to bear on central portions of said bars, at least one friction wheel and guide bar being located on each side alongside the bars to be transported, the surfaces of the friction wheels extending slightly beyond the surfaces of the guide bars above and below the guide bars.

3,889,799
CONVEYING APPARATUS FOR GRANULAR MATERIALS

Camillo Pirovano, Via Spluga, Cernusco Lombardone, Italy

Filed Nov. 26, 1973, Ser. No. 419,051
Claims priority, application Italy, Dec. 20, 1972, 33307/72
Int. Cl. B65q *19/08*
U.S. Cl. 198—168 **3 Claims**



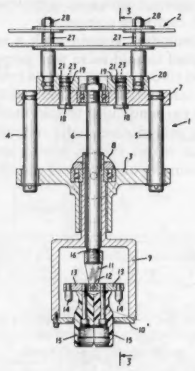
1. A conveying apparatus for granular materials comprising an enclosed guideway, a cable driven to slide within said guideway, and radially extending mutually spaced apart tab members on and normal to said cable substantially mating the peripheral outline of the guideway extending from the cable alternatingly in angularly shifted directions.

3,889,800
BOTTLE CHUCK HAVING A SNAP-ON SNAP-OFF COUPLING

Dale George Frische, Belleville, Ill., assignor to Indian Head Inc., New York, N.Y.

Filed Jan. 10, 1974, Ser. No. 432,188
Int. Cl. B65g *17/00*
U.S. Cl. 198—179 **2 Claims**

1. In a vertically retractable rotatable bottle chuck attachable to a belt of an overhead chuck conveyor, the improvement which comprises a first support plate having at least one protruding lock pin and a recesss in its exposed periphery and a second support plate having at least one mating orifice for receiving each aligned lock pin and release means intersecting each orifice for releasably engaging a lock pin recess, one of

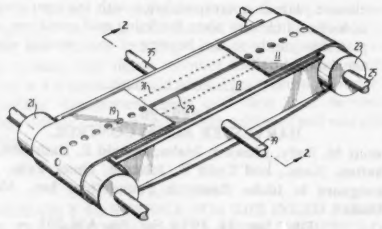


the plates supporting the bottle chuck and the other of the plates being attachable to the belt of the overhead chuck conveyor; said release means being a protuberant spring-loaded ball housed within a chamber of a set screw.

3,889,801
VACUUM CONVEYOR BELT WITH AIR BEARING

Harold E. Boyer, Anna, Ohio, assignor to Bell & Howell Company, Sidney, Ohio

Filed Oct. 26, 1972, Ser. No. 301,120
Int. Cl. B65g *15/28;* **B65h** *5/22*
U.S. Cl. 198—184 **13 Claims**



1. A vacuum-type conveyor system for conveying an article comprising:

a conveyor belt having a first side for carrying said article and a second side opposite said first side, said conveyor belt including apertures arranged in a narrow longitudinally extending pervious zone of said conveyor belt, and said conveyor belt further including a longitudinally-extending impervious zone positioned on each side of said pervious zone, said impervious zones being substantially free of apertures and being flat on said second side;

a supporting surface adjacent said second side of said conveyor belt, said supporting surface defining an elongated surface negative-pressure zone, said surface negative-pressure zone being adjacent said belt pervious zone and arranged parallel thereto, said supporting surface further defining a plurality of positive pressure apertures arranged in a plurality of elongated areas of said supporting surface, said elongated areas being parallel to, but sepa-

rated from said surface negative-pressure zone and respectively lying under said impervious zones of said belt; negative fluid-pressure means for creating fluid pressure forces at said surface negative-pressure zone which acts through said surface negative-pressure zone and said belt apertures to hold said article against said first side of said conveyor means; and

positive fluid-pressure means for creating positive fluid pressure forces at said positive-pressure apertures which act on said second side of said conveyor at said impervious zone, to create a positive pressure air bearing between said impervious zone and said supporting surface to reduce drag caused by said negative pressure.

3,889,802

BELT CONVEYOR AND METHOD FOR OPERATING SUCH A CONVEYOR

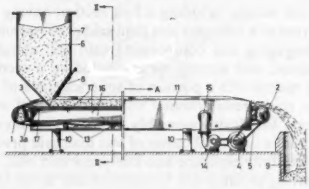
Cornelius O. Jonkers, Morshoekweg 5, Hengelo, Netherlands

Filed Sept. 12, 1973, Ser. No. 396,436

Claims priority, application Netherlands, Apr. 17, 1970, 7005538

Int. Cl. B65g *15/00*

U.S. Cl. 198—184 **6 Claims**



1. In a belt conveyor system in which the operative run moves over a perforated bed, means being present to admit somewhat viscous fluid such as air under preessure between the lower surface of this operative run and said perforated bed for supporting said operative run, said fluid being admitted through openings in said perforated bed, the improvements comprising at least 75 percent of the total flow area of said openings situated within the area of the bed corresponding with the central half of the width of the belt, said openings in the bed corresponding with said central half of the width of the belt have a total flow area α per square meter belt surface which is larger than about 0.6cm.^{2} per square meter and smaller than about 3.5cm^2 per square meter, the mean number n of openings corresponding with said central half of the belt width per meter length of the bed being higher than about 1/B and less than about **50**, and in which the following relationships are satisfied:

$$\alpha = A/BL$$

and

$$n = N/L$$

where

A=the total flow area of the openings in the bed within the area corresponding with the central half of the belt in m**2**;

B=the width of the belt, in m;

L=the length of the bed, in m;

N=the total number of openings within the area of the bed corresponding with the central half of the belt;

and the flow area **0** of a single opening satisfying the requirement $0.8\times10^{-6}<O/B<50\times10^{-6}$ in which O is measured in m^2 and B in m.

3,889,803

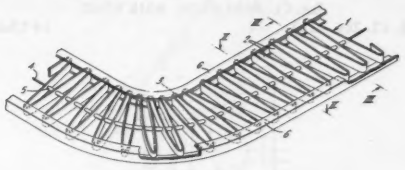
OPENWORK CONVEYOR BELTING

William Paul White, Ellesmere Port, England, assignor to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 245,482, April 19, 1972, abandoned. This application Nov. 30, 1973, Ser. No. 420,719

Int. Cl. B65g *15/54*

U.S. Cl. 198—189 **22 Claims**



1. A conveyor having an openwork endless conveyor belt having lateral edges and comprising a series of struts, each strut extending from a transverse end at one lateral edge of the conveyor belt transverse to the direction of travel of the conveyor to a transverse end at the other lateral edge of the conveyor belt, and located in spaced relationship from each other in the direction of travel and interconnected at their said transverse ends to form a substantially zig-zag configuration each strut having a cross-section, viewed in a vertical plane parallel to the said direction of travel, which is thin in the said direction of travel and elongated perpendicular to the said direction of travel so that each strut is sufficiently spring-like to flex, between its transverse ends, to negotiate both horizontal axis curves and vertical axis curves, spacer means disposed centrally between said transverse ends between each strut and its adjacent struts for maintaining a substantially uniform spacing between each strut and its adjacent struts, a flexible inextensible means extending in the said direction of travel and located centrally between the transverse ends for comprising and locating said spacer means, guide means for receiving the interconnected ends for confining the said interconnected ends against movement perpendicular to the said direction of travel both (a) in the plane of the conveyor and (b) perpendicular to the plane of the conveyor, and drive means for driving the belt in said direction of travel.

3,889,804

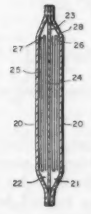
DISPOSABLE TOWEL

Leonard E. Ravich, Boston, Mass., assignor to Gorham International, Inc., Gorham, Maine

Filed Mar. 14, 1973, Ser. No. 341,277

Int. Cl. B65d *81/32*

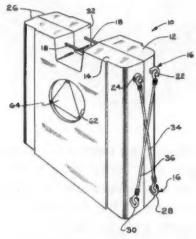
U.S. Cl. 206—223 **8 Claims**



1. An article comprising an airtight pouch where said pouch is divided into two chambers, each containing a towel, the towel in one of said chambers being impregnated with a solution of oxidizing agent and the towel in the other of said chambers being impregnated with a solution of reducing agent, whereupon with rupture of said chambers, the two

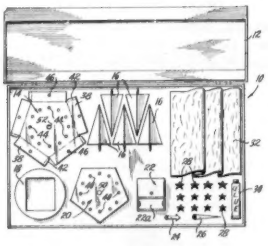
towels are brought together causing mixing of said oxidizing agent and reducing agent to cause an exothermic reaction and a temperature rise in said towels above ambient temperature.

3,889,805
FISHING TACKLE RACK
Chauncey F. Korten, 2410 Vinewood, Ann Arbor, Mich. 48104
Filed Apr. 30, 1973, Ser. No. 355,545
Int. Cl. B65d *85/00;* **A01k** *97/00*
U.S. Cl. 206—223 **14 Claims**



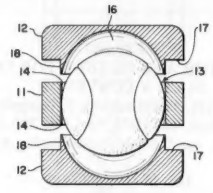
1. A fishing tackle rack comprising first and second body portions each having top and bottom edges and upright hinged and unhinged edges and a plurality of cavities therein for storing fishing tackle, and hinge means hingedly connecting said body portions, said hinge means comprising first and second stretch cords located respectively adjacent to the top and bottom edges of the body portions and each secured at one end of the unhinged edge of the first body portion and at the other end to the unhinged edge of the second body portion and each extending through both body portions and the adjacent hinged edges thereof.

3,889,806
CLOCK HOUSING AND DECORATIVE MEANS THEREFOR
Frank P. Casella, 2404 Freemansburg Ave., Easton, Pa. 18042
Filed Feb. 14, 1974, Ser. No. 442,324
Int. Cl. B65d *79/00;* **G04b** *37/00*
U.S. Cl. 206—223 **4 Claims**



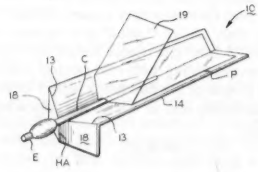
1. A clock kit comprising a container having enclosed therein, a clock housing blank, a plurality of decorative elements adapted to project from the housing, means for attaching said decorative means to said housing, a clock motor support means, a motor housing, hour and minute hands, a shaft extending from said motor housing for connecting said hour and minute hands to said motor housing, hour indicators, and means for connecting said hour indicators to said clock housing, said clock housing blank comprising a base having an opening medially located to provide access for said shaft, a plurality of circumferential tabs extending from the base, the tabs when taken together substantially extending about the circumference of the base, which tabs when folded out of the plane of said base to be perpendicular thereto provide a housing adapted to engage and hold said decorative means and said motor support.

3,889,807
MEANS FOR PRESERVING TENNIS BALLS OR THE LIKE
Robert S. Feinberg, 81 Edgemont Place, Teaneck, N.J. 07666, and David A. Selick, 76 LeRoy Street, Tenafly, N.J. 07670
Filed Apr. 2, 1973, Ser. No. 347,080
Int. Cl. B65d *85/00, 85/62*
U.S. Cl. 206—315 **18 Claims**



1. A storage receptacle for a gas pressurized ball having an externally unstressed predetermined outside diameter comprising first means including a first section having an interior face portion of a diameter less than said predetermined diameter for engaging and compressing said ball about a median girth thereof, and second means including a second section having a recess with a portion of spherical face of a diameter less than said predetermined diameter and not exceeding a hemisphere for closing assembly with said first means to form a substantially spherical cavity of less than said predetermined diameter to fully embrace and compress said ball, one of said means having an integrally formed annular lip portion projecting therefrom and coaxial to and matingly received within a corresponding recess in the other of said means when in closed assembly, whereby the cavity is fully closed even when the first and second means do not abut.

3,889,808
STERILE PACKAGE
Charles Robert Helms, Barto, Pa., assignor to Container Corporation of America, Chicago, Ill.
Filed Apr. 11, 1974, Ser. No. 459,942
Int. Cl.[2] B65O *5/50;* **A61M** *25/02*
U.S. Cl. 206—364 **4 Claims**



1. A sterile package for an elongated surgical article such as a catheter or the like comprising:
   a. an elongated backing panel formed of a unitary blank of foldable paperboard;
   b. a closing panel of flexible sheet material overlying said backing panel for enclosing said article against said backing panel;
   c. said closing panel being secured to said backing panel adjacent the perimeter thereof;

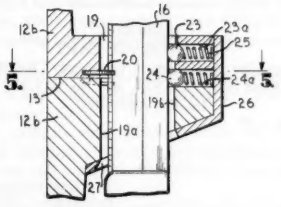
d. said backing panel including a major section and a minor section separated from each other by a score line;
e. said score line extending generally transversely across said backing panel but in a direction other than straight across, so that when said minor section is folded downwardly from said major section on said score line, a longitudinally extending depression is formed in said major section to provide a trough for supporting a major portion of said article, with the remaining portion of said article extending over said score line beyond said major section, and a bow is formed in said minor section so that said minor section serves as an easel for supporting an adjacent end of said major section.

3,889,809

COMBINED STORAGE HOLDER AND SHARPENER FOR KNIVES

Samuel L. McNair, Overland Park, Kans., assignor to Dazey Products Co., Kansas City, Mo.

Filed May 29, 1973, Ser. No. 364,904
Int. Cl. B65d *85/54*
U.S. Cl. 206—372 **3 Claims**



1. A combined cutlery holder and sharpener comprising
a support member having a slot therethrough for reception of a blade with a cutting edge, said slot having opposed side edges,
blade sharpening means at one side edge of said slot for sliding engagement with the opposite sides of said cutting edge during insertion and removal of said blade from said slot, and
means at the other side edge of said slot resiliently biasing said blade toward and into contact with said blade sharpening means while said blade is in said slot.

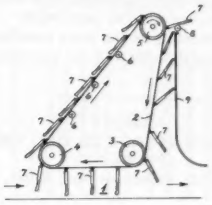
3,889,810

APPARATUS FOR PICKING UP FILAMENTOUS OR LONG-FIBRED ELEMENTS FROM FLUID FLOWING THROUGH A CHUTE

Kaj Hansen, Osterbrogade 2, 4800 Nykobing Falster, Denmark

Filed Sept. 24, 1973, Ser. No. 399,704
Claims priority, application Denmark, Sept. 25, 1972, 4736/72
Int. Cl. B07c
U.S. Cl. 209—76 **11 Claims**

1. Apparatus for picking up filimentous or long-fiber debris from fluid flowing through a chute, comprising: an endless belt; at least two pulleys for driving the belt along a path, one portion of the path extending above and substantially parallel to the chute, the belt moving along the one portion in a direction contrary to the fluid flow through the chute, and another portion of the path extending upwardly from the first portion of the path about one pulley and downwardly about another pulley to return to the first portion of the path; a plurality of flexible scarfs at intervals along the belt; means attaching one side of the scarfs to the belt; a plurality of slat-shaped pick-up members spaced across the belt and adjacent each of the scarfs for forming rows of members across the belt at the intervals of the scarfs along the belt; means attaching the pick-up members to the other side of the scarfs for swingably suspending the pick-up members from the belt with the scarfs, the pick-up members extending from the scarfs into the fluid in the chute when the members are carried on the belt along the one portion of the path for picking up the debris from the



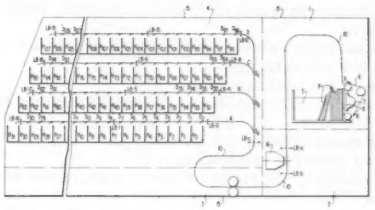
fluid in the chute and carrying the debris to the downwardly extending portion of the path; and a stop member adjacent the other pulley at the downwardly extending portion of the path hit by the pick-up members for discharging the debris and swinging the members toward the belt for passing between the stop and the belt.

3,889,811

FLAT-ARTICLE SORTING APPARATUS FOR AN AUTOMATIC MAIL HANDLING SYSTEM AND THE LIKE

Syoichiro Yoshimura, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed June 18, 1973, Ser. No. 371,018
Claims priority, application Japan, June 19, 1972, 47-61512
Int. Cl. B07c *5/344*
U.S. Cl. 209—74 M **3 Claims**



1. A flat-article sorting apparatus for an automatic mail handling system and the like, comprising:
a plurality of groups of flat-article receiving pockets;
means for detecting coded data on flat-articles to be sorted, said data identifying the pockets into which said flat articles are to be diverted and comprising a first and a second coded data identifying one of said groups and one of said pockets in said group, respectively;
first means connected to said detecting means for temporarily storing said data;
means for conveying said flat articles along a transport path, said transport path having a main path and branching paths, each branching path corresponding to one of said groups;
means installed on said transport path for detecting said flat articles and producing first shift pulses;
means for delaying said first shift pulses and producing second shift pulses;
second means for storing and transferring said data stored in said first storing means in response to said first and second shift pulses, said second storing means having a plurality of storing stages, said first shift pulses being applied to storing stages of said second storing means which are not adjacently positioned, said second shift pulses being applied to storing stages of said second stor-

ing means adjacent to said storing stages to which said first shift pulses are applied; and

means responsive to said data transferred in said second storing means for diverting flat-articles into branching paths and pockets within said branching paths;

said pockets being positioned so that the distances of the pockets having an identical second code from coded data detecting means are equal to each other;

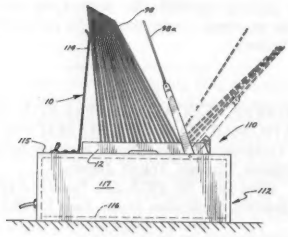
said flat-article detecting means being installed at intervals equal to an integral multiple of the interval of said pockets.

3,889,812

PHONOGRAPH RECORD TILTING DISPLAY APPARATUS

Julian Gutierrez, 6233 Brookview Ave. South, Minneapolis, Minn. 55424

Filed May 24, 1974, Ser. No. 473,135
Int. Cl. A47f *3/08, 7/00;* **A47g** *29/00*
U.S. Cl. 211—1.5 **11 Claims**



1. A phonograph record tilting display apparatus, having in combination

a rack having forwardly self-tilting records thereon, save for the first record thereof,

a housing supporting said rack,

a member carried by said housing forwardly tilting said first record,

spring means actuating said member,

a motor carried by said housing,

means driven by said motor operatively engaging said member,

said means moving said member reversely tilting said records to a rearward tilted position when said records have reached a forwardly tilted position,

said means withdrawing from operating engagement with said member upon completion of said rearward tilting of said records, and

said spring means actuating said member to forwardly tilt said first record upon said means withdrawing from operative engagement with said member.

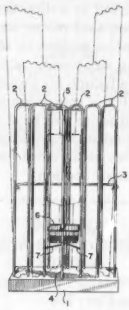
3,889,813

MERCHANDISE DISPLAY STAND

Thomas C. Wright, Huntington Beach, Calif., assignor to Vistron Corporation, Cleveland, Ohio

Filed Mar. 11, 1974, Ser. No. 450,068
Int. Cl. A47f *7/00*
U.S. Cl. 211—13 **3 Claims**

1. A merchandise display stand comprising a rectangular base bearing a plurality of vertical loops which are outwardly angled and progressively positioned toward the outward ends of the base at opposite inclination on each side from the center back of the base, said stand having a first reinforcing tube parallel to the plane of said base attached to the backside of said loops and being located about midway in the length of the loops and a vertical tubular pole secured near the front and center of said base which is connected to the fronts of the center two vertical tubular loops and at the top of said tubular pole by means of a second reinforcing tube which is parallel



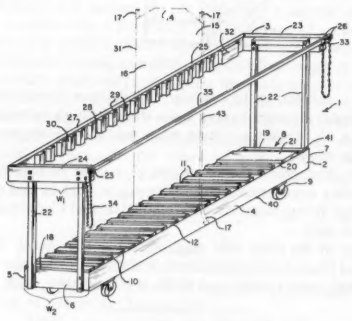
to the plane of the base and a basket for holding displayed items secured to said pole.

3,889,814

COT STORAGE CART

Joseph Albert Rice, 8262 Tulane, University City, Mo. 63132

Filed Nov. 28, 1973, Ser. No. 419,820
Int. Cl. A47f *7/00*
U.S. Cl. 211—27 **9 Claims**



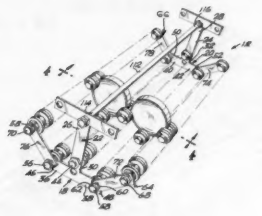
1. A cot storage cart for storing a plurality of sleeping cots, comprising:

a base assembly, said base assembly including a supporting area having a first end and a second end, said supporting area having a plurality of spacers attached thereto, adjacent spacers defining a plurality of grooves, said base assembly having means for permitting removal of said cots, said cot removal permitting means being formed along one of said first and said second ends of said base assembly, said base assembly having a length dimension and width dimension;

support means attached to said base assembly and extending upwardly therefrom; and

an upper support assembly including a pair of end pieces extending outboardly of the width dimension of said base assembly, and a horizontal member extending between a first end of respective ones of each of said end pieces, said horizontal member having a plurality of notches formed in it, individual ones of said notch plurality of said horizontal member being aligned with individual ones of said groove plurality of said base assembly, and guard means removably mounted to said upper support assembly between a second end of respective ones of each of said end pieces.

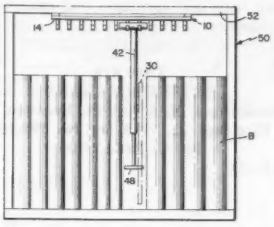
3,889,815
LENS TRAY
Joseph Merle, 8101 Crespi Blvd., Miami Beach, Fla. 33141
Filed July 27, 1973, Ser. No. 383,345
Int. Cl. A47f *7/00*
U.S. Cl. 211—41 **5 Claims**



1. An adjustable lens holder tray comprising:
A. a frame including, a matching first and second end member in spaced confronting relation, each end member including a standard portion having an upper and a lower end zone, and a pair of arm portions adjacent said lower end extending laterally and oppositely from said standard portion,
B. a central elongate member extending between said end members and connecting the lower end zones of each standard portion,
C. a first elongate side member parallel to said central elongate member connecting the opposing arm portions of the first and second end members on one side of said standard portions,
D. a second elongate side member parallel to said central elongate member connecting the opposing arm portions of the first and second end members on the other side of said standard portions,
E. means to connect said elongate members to said end members,
F. a first and a second generally U-shaped member, each having a base comprising an elongate member parallel to said central elongate member and each having a pair of legs of common length,
G. pivot means connecting the terminal end of the legs of said first U-shaped member to the end members on one side of said standard portion,
H. pivot means connecting the terminal ends of the legs of said second U-shaped member to the end members on the other side of said standard portion,
I. said U-shaped members being swingable about the first and second elongate members respectively with the base portion of said U-shaped members at all times parallel to said central elongate member,
J. said elongate members and said base of each of said U-shaped members comprising a plurality of separate spaced, three point contact seats on opposite sides of said standard portion for seating circular objects,
K. said U-shaped members comprising adjustment means for adjusting the size of the seats on swinging movement of said U-shaped members.

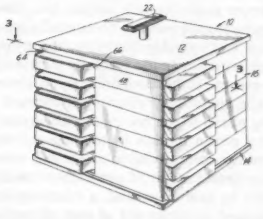
3,889,816
BOOK HOLDER AND SEPARATOR
Rafael Marcelo Herryman, 121 E. Allegheny St., Martinsburg, Pa.
Filed Jan. 9, 1974, Ser. No. 431,989
Int. Cl.[2] A47B *65/00*
U.S. Cl. 211—43 **5 Claims**

1. A holder and separator for books in a bookcase or the like having a top shelf above the books comprising a pendulum member having a head end and a free end, said free end having a magnet member thereon and being elongated so as to be extended transversely to the swinging path of said pendulum member, means for supporting said pendulum at said head end for swinging movement between a horizontal position adjacent the top shelf of the bookcase above the books contained therein and a vertical position between two books



in the bookcase for maintaining the books in a separated condition, and a magnetically attractable member affixed underneath the top shelf of the bookcase and adapted to be contacted by said magnet member when said pendulum member is in its horizontal position.

3,889,817
RACK
Joseph L. Berkman, 48 Country Rd., Mamaroneck, N.Y. 10543
Filed July 25, 1973, Ser. No. 382,302
Int. Cl. A47b *81/00*
U.S. Cl. 211—163 **5 Claims**



1. Rack element adapted for storing both magnetic tape cartridges and cassettes, comprising: a plate-like supporting surface of generally square configuration, four arm-like dividing walls of substantially uniform height radiating outwardly of the center generally perpendicular the edges, four edge walls of substantially similar uniform height extending along the edges of said supporting surface from the outward end of each of said dividing walls to each corner, of said supporting surface, thereby defining four similar generally open topped generally rectangular bins enclosed on two non-adjacent sides by a pair of side walls consisting of one of said dividing walls and one of said edge walls and at the back by a back wall comprising an adjacent one of said dividing walls and having a generally open and unobstructed front opening extending between a said one of said edge walls and one of said dividing walls opening outwardly along an edge of said surface; at least a pair of bosses extending generally perpendicularly of said supporting surface opposite the said walls and offset therefrom by the thickness thereof so that a plurality of such rack elements may be stacked in general alignment one above the other and be retained in such general alignment by engagement of said bosses of one rack with the side walls of the next adjacent rack element; and rib means on said rack element serving as stop means for a magnetic tape cassette box, wherein said side walls are spaced apart a distance substantially equal to the width of a magnetic tape cassette box, and

said rib means being spaced inwardly of said front opening a distance such that a cassette box abutted against said rib means projects at one side thereof from said opening of a bin a distance substantially equal the projection of a magnetic tape cartridge inserted within a bin against said backwall, thereby providing an aesthetically pleasing appearance to said rack element with said cartridges and cassettes in general projecting alignment.

3,889,818

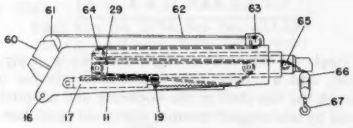
EXTENSIBLE CRANE

Carl G. Wennerstrom, 3016 Park Pl., Evanston, Ill. 60201

Filed Sept. 21, 1973, Ser. No. 399,408

Int. Cl. B66c *23/06*

U.S. Cl. 212—55 **7 Claims**



1. A crane comprising means for hoisting a load including a winch and a hoisting cable; a telescoping boom assembly carrying said hoisting cable on sheaves for compensation of free cable length upon extension and retraction, said boom assembly including a first boom and a second boom extensible from said first boom by means of a boom extending piston in a cylinder carried by said first boom, said boom extending piston carrying a pinion for cooperation with gear racks on said first and second booms to double the extension distance produced by motion of said boom extending piston; means for rotating said boom assembly with respect to a base to swing a load; means including a generally horizontally mounted boom elevating piston and cylinder assembly, the cylinder of said boom elevating assembly being pivotally mounted for limited motion with respect to the horizontal upon elevation of the boom, a linkage operatively coupling a forward end of the boom elevating piston to the boom for conversion of substantially horizontal piston motion to topping movement of the boom, said linkage comprising a crosshead carried by the boom elevating piston, a pair of generally rearwardly extending arms carried by said crosshead, a relatively short linkage pivotally connected to a rear end of each of said arms and to a part of the boom which moves down as the boom is elevated, and a relatively long, generally L-shaped link pivotally connected near the rear end of each said arm and to a fixed frame element; said hoisting, telescoping, swinging and elevating means being concurrently and independently operable for transporting a load by any combination of hoisting, telescoping, elevating and swinging.

3,889,819

OVERHEAD ROPEWAY CRAB FOR CONVEYING LOADS

Josef Koller, A-6330 Kufstein, Endach, Austria

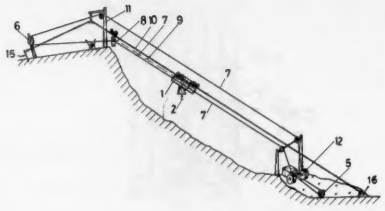
Continuation-in-part of Ser. No. 252,835, May 12, 1972, abandoned. This application Nov. 15, 1973, Ser. No. 416,282

Claims priority, application Austria, May 17, 1971, 4254/71

Int. Cl. B66c *21/00*

U.S. Cl. 212—94 **3 Claims**

1. Load hauling apparatus comprising a substantially stationary cable, a displaceable cable separate from and displaceable along said stationary cable, a crab, coupling means to clamp said crab selectively to said stationary cable or to said displaceable cable whereby said crab is affixed to said cable or displaceable with said displaceable cable, a load lifter displaceable with the displaceable cable and extending through said crab by an amount corresponding to relative displacement between the crab and load lifter, the displaceable cable including ends, further means connecting said ends and thereby connecting the displaceable cable in a loop, means slidably supporting said further means on said stationary cable and preventing twisting of said cables, the load lifter extending through said crab and including an end connected to said further means, said further means holding the said end of the



load lifter in spaced relation relative to the ends of the displaceable cable to promote the avoiding of engagement between the load lifter and displaceable cable, said load lifter including a free end, and load engaging means on the free end of the load lifter.

3,889,820

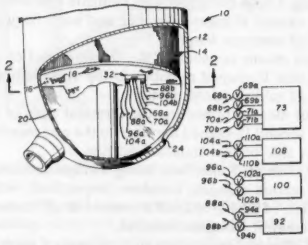
METHOD AND APPARATUS FOR SUSPENDEDLY SUPPORTING A PLATFORM

Eugene Ranger, East Ridge, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 1, 1973, Ser. No. 384,659

Int. Cl. F28g *15/02*

U.S. Cl. 214—1 BB **22 Claims**



1. A platform for support below a member comprising:

a. a base portion;

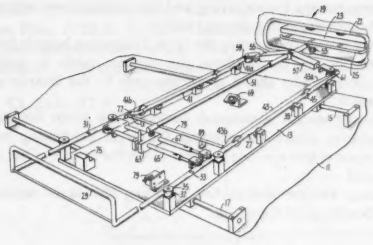
b. at least two upwardly extending support means supportingly connected to said base portion and independently reciprocable relative thereto between raised and lowered positions and including remotely actuable means therewith for grippingly engaging said member to support a portion of the weight of said platform therefrom when in said engagement; and

c. remotely controllable means for selectively applying a force to said support means relative to said base portion of a magnitude and direction to selectively move said support means either toward said raised position or said lowered position, even when said portion of platform weight is supported thereby.

3,889,821
APPARATUS FOR LOADING AND UNLOADING SUSCEPTORS FROM REACTOR

Gerald M. Bowers, Los Altos, and Norman S. Cay, Los Gatos, both of Calif., assignors to Unicorp Incorporated, Sunnyvale, Calif.

Filed Jan. 24, 1974, Ser. No. 436,339
Int. Cl. B23q *7/06*
U.S. Cl. 214—1 BB **6 Claims**



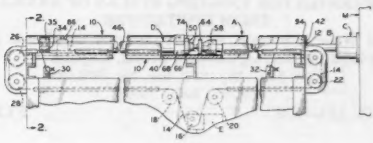
1. An apparatus for loading and unloading a susceptor from a reactor tube, comprising:
   a frame,
   a main carriage slidably held by said frame for movement having a direction of motion between extreme forward and rearward positions with respect thereto,
   a pair of cam tracks attached to said main carriage to extend generally along said direction of motion and held generally in a horizontal plane, said cams having a varying spacing therebetween along their length with the maximum separation between the cams occurring at the ends thereof,
   a lift carriage held by said main carriage in a manner to be movable therealong in said one direction,
   a lifting element mounted forward of said lift carriage, and means as part of said lift carriage and riding along said cam tracks on cam followers for moving said lift element upward as said cam followers contact portions of the cam tracks that are coming closer together and downward as the cam followers contact cam portions that move further apart, whereby the horizontal paths of said cams are converted into vertical motion of said lift element in response to relative movement of said lift carriage back and forth in said one direction along said main carriage.

3,889,822
BAR FEEDER

Thomas A. Ross, Mayfield Heights, Ohio, assignor to Mayfran Incorporated, Mayfield, Ohio

Filed Mar. 25, 1974, Ser. No. 454,327
Int. Cl. B23g *5/22*
U.S. Cl. 214—1.5 **17 Claims**

1. In a bar feeder including push rod means, means supporting said push rod means for reciprocable movement between first and second positions, said supporting means having a discharge end and a rear end, said push rod means having a leading end, said leading end in said first and second positions of said rod means being respectively between said rear and discharge ends and beyond said discharge end in the direction from said rear end toward said discharge end, and means to reciprocate said push rod means between said first and second positions, the improvement comprising; a support member releaseably interengageable with said push rod means for movement therewith, said member having a portion interposed between said push rod means and supporting means, and means adjacent said discharge end of said supporting means for releasing said member from said push rod means for said interposed portion to slidably support said push rod means during movement of said leading end between said

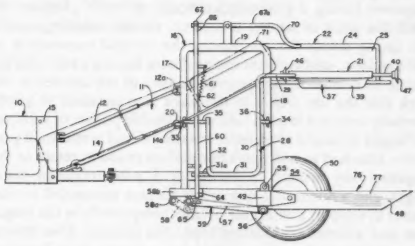


discharge end and said second position of said push rod means.

3,889,823
AUTOMATIC BALE STOOKER

George Williamson, R.R. No. 2, Red Deer, Alberta, Canada

Filed Mar. 13, 1973, Ser. No. 340,678
Int. Cl. B65g *57/32*
U.S. Cl. 214—6 B **11 Claims**



1. A stooker for the automatic construction and deposit of a stock from bales discharged from a travelling baler comprising, in combination:
   i. bale elevating means for receiving and elevating bales discharged from said baler;
   ii. a bale receiving and positioning station for receiving bales from said bale elevating means and for angularly positioning thereof in a predetermined elevated deposit position, said pale receiving and positioning station comprising a pair of horizontally extending parallel bale receiving arms and bale support means on said bale support arms adapted to engage and support a bale, at least one of said bale support means being pivotably mounted upon an associated said bale support arm, and bale engaging and tripping means associated with one of said bale support arms to effect angulations of said bale within said station;
   iii. bale release means for programmed release of bales from said bale receiving and positioning station whereby each of said bales is deposited at a predetermined position in a stook being formed, said bale release means comprising means for selectively locking and releasing said pivotable bale support means responsive to the position of a bale upon said pair of bale receiving arms;
   iv. a stock forming platform adapted to receive bales upon release thereof by said bale release means for assembly of a stock thereon;
   v. stook dump means responsive to the movement of bales into the bale receiving and positioning station and the assembly condition of the stook under construction on the stook forming platform for discharge of assembled

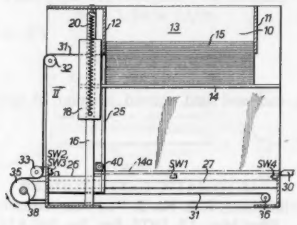
stooks from said stook forming platform to the surface of the ground.

3,889,824

APPARATUS FOR EJECTING STACKS OF ARTICLES FROM CONTAINERS

David Wood, Clevedon, England, assignor to Masson Scott Thrissell Engineering Limited, Bristol, England

Filed Nov. 28, 1972, Ser. No. 309,988
Int. Cl. B65g *59/06*
U.S. Cl. 214—6 H **5 Claims**



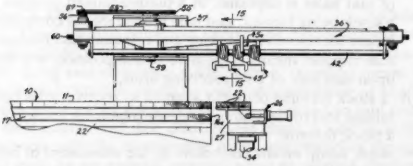
1. Sorting apparatus for mail, cards, or like flat articles, including a magazine for holding a stack of said articles, said magazine having a generally vertically movable platform on which the stack of articles is built up, means including a resilient spring device for controlling the vertical movements of said platform, said resilient spring device having a rate characteristic so related to the average density of the articles in the stack that the top article in the stack is maintained at a substantially constant level, a laterally movable pusher of substantial height arranged to transfer a stack off said platform, a gate device attached to said magazine and arranged to retain in the magazine any articles in excess of a predetermined stack height, and a horizontal supporting surface connected to said pusher to support said excess articles temporarily in the magazine, and wherein said sorting apparatus includes drive means for actuating said pusher comprising a power drive member clutch means for connecting said pusher to said drive member for ejector operations, and spring means for returning said pusher when the clutch is dis-engaged, and automatic control means for operating said platform and its pusher in a cycle wherein the platform descends under the weight of the stack to a predetermined level, the pusher moves horizontally to eject the stack off the platform, the said platform returns upwardly to its starting position below said magazine, and the said pusher returns horizontally to its original position.

3,889,825

LAYER SEPARATING APPARATUS FOR LUMBER STACKING MACHINES

Donald E. Mosely, Spokane, Wash., assignor to Bitco, Inc., Spokane, Wash.

Filed Sept. 24, 1973, Ser. No. 399,939
Int. Cl. B65g *57/26*
U.S. Cl. 214—6 M **10 Claims**



1. A layer separating apparatus for use in conjunction with a lumber stacking machine of the type utilized to form an upright stack of boards by placing successive layers of boards one on another with the boards being arranged lengthwise between ends of the stack,

said layer separating apparatus comprising:

a support table for receiving and supporting a prescribed number of layer separating boards;

a layer separating board positioning means for locating the layer separating boards at specific positions on the support table;

means for elevating the layer separating boards to an elevation above the stack;

clamp means for receiving and supporting layer separating boards from the support table;

pivot means for moving the layer separating boards held by the clamp means from the support table to positions elevationally above and transverse to the boards in the stack;

spacing means associated between the pivot means and clamp means for spacing the layer separating boards apart relative to one another along the length of the stack; and

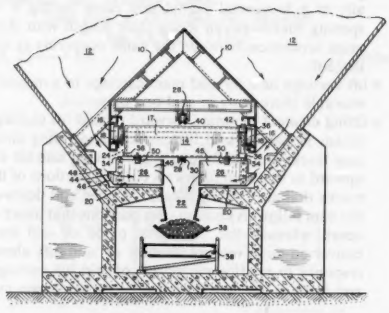
clamp release means for releasing the layer separating boards onto the stack.

3,889,826

REVERSIBLE CAR PLOW FEEDER FOR STOCK PILE RECOVERY SYSTEMS

Robert Lee Pate, Pittsburg, Kans., assignor to The McNally Pittsburg Manufacturing Corporation, Pittsburg, Kans.

Filed Jan. 25, 1974, Ser. No. 436,614
Int. Cl. B65g *65/44*
U.S. Cl. 214—17 DA **6 Claims**



1. An apparatus for moving material such as coal flowing from a stock pile as it flows onto a pair of spaced floor sections separated by an elongated delivery chute in which movement of the material from a spaced floor section to and into the delivery chute is accomplished, the apparatus comprising

a. a reversible car moving back and forth in a direction substantially parallel to the axis of the elongated delivery chute, said car having a central portion which moves over the chute and corresponds in width to the chute and said car having a side portion which is positioned above and moves back and forth over a spaced floor section;

b. a swingable car plow on the car;

c. pivot means connected to the car and positioned to permit the car plow to swing about an axis which passes in a generally vertical plane through said side portion of the car and through the floor section;

d. two material moving surfaces on the plow, one surface for causing material to move from the spaced floor section into the delivery chute when the car is moved in one linear direction and the other surface for causing material to move from the same spaced floor section when the car is moved in the other direction, said plow swingably

engaged with said pivot means at one end of said plow such that the pivot engaging end portion of the plow moves ahead of the rest of the plow as the car is moved in either direction; and

e. stop means to limit the swinging of the plow in each arcuate direction, said stop means being positioned to effect engagement with the plow surfaces in substantially vertical planes that pass through the side portion of the car.

3,889,827

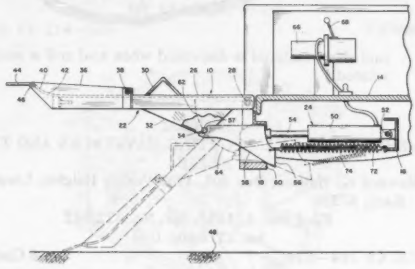
TRUCK LOADING AND UNLOADING APPARATUS

Boyce Fine, 3720 E. Archer, Tulsa, Okla. 74115

Continuation-in-part of Ser. No. 160,056, July 6, 1971, abandoned. This application July 23, 1973, Ser. No. 381,726

Int. Cl. B60p *1/44*

U.S. Cl. 214—77 P **8 Claims**



1. In a truck, having a truck bed thereon, and a tailgate section pivotally attached along one edge thereof to one edge of the truck bed, a loading ramp apparatus comprising a ramp section having one edge thereof pivotally secured along the free edge of the tailgate section, said ramp section being foldable against the tailgate section and being free to rotate 180° for extending the length of the tailgate section whereby in its lowest position said tailgate section and ramp section form an inclined ramp structure from the truck bed to the ground; bracket means secured to the outer surface of the tailgate section; movable ramp support means comprising a fluid operated cylinder having one end thereof pivotally secured beneath the truck bed, an elongated piston rod reciprocally disposed within the cylinder and having one end thereof extending outwardly from the opposite end of the cylinder, bracket support means secured to the outer end of the piston rod and said bracket support means being separate from the bracket means and engagable therewith when the tailgate section is between a substantially horizontal position and its lowest position, guide means carried by the truck bed operably connected to the bracket support means, said guide means being capable of guiding the bracket support means along a path which coincides with the path of the bracket means when the tailgate section is pivoted with respect to the truck bed.

3,889,828

NOISE REDUCTION APPARATUS AND METHOD

Fred T. Smith, Dearborn Heights, Mich., assignor to Sargent Industries, Inc., Los Angeles, Calif.

Continuation of Ser. No. 401,410, Sept. 27, 1973, abandoned, which is a division of Ser. No. 274,798, July 24, 1972. This application May 8, 1974, Ser. No. 467,858

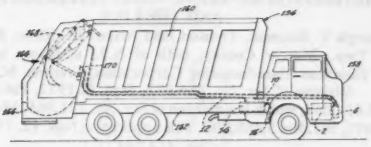
Int. Cl. B60p *1/00*

U.S. Cl. 214—83.3 **34 Claims**

1. In combination for reducing noise from a vehicle engine in driving an auxiliary mechanism disposed on the vehicle where the mechanism is auxiliary to the operation of the vehicle and constitutes apparatus for packing refuse in refuse equipment,

first means operable to provide for an operation of the auxiliary mechanism,

second means responsive to the operation of the first means for maintaining the vehicle engine at a speed near idling speed,



third means responsive to the operation of the vehicle engine at a speed near the idling speed for producing a flow of fluid under pressure at a controlled rate to obtain the operation of the auxiliary mechanism, and

fourth means responsive to the flow of fluid from the third means for providing for introduction of such fluid to the auxiliary mechanism to drive the auxiliary mechanism.

3,889,829

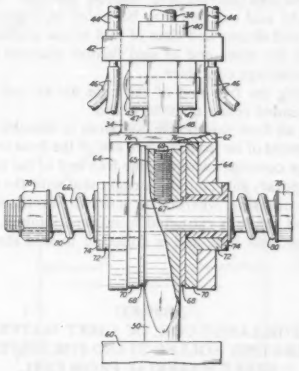
MOBILE REFUSE COLLECTION TRUCK

Glenn L. Dutton, Houston, Tex., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Nov. 26, 1973, Ser. No. 418,901

Int. Cl. B66c *1/47*

U.S. Cl. 214—147 G **3 Claims**



1. In a mobile refuse collection truck having a boom mounted on and operated from the truck, an arm pivotally mounted at the outer end of the boom, a cage suspended from the outer end of the arm constructed and arranged to pick up refuse, the improvement comprising a pair of spaced flanges extending from the outer end of the boom, each of said flanges having a hole therethrough perpendicular to the boom, a shaft extending through the holes in the flanges, said arm having a disc at its upper end encircling the shaft between the flanges, means securing the disc to the shaft, a wear plate rotatable on the shaft on each side of the disc, a pressure plate slidable axially on the shaft between the wear plate and the flange, a hub extending outwardly from the pressure plate through and beyond the flange, a bushing between the pressure plate and the shaft and covering the outer end of the hub pressure plate, a helical spring encircling the shaft and bearing against the end of the bushing, and a threaded nut engaging threads on the shaft for adjustment of the force exerted by the spring to urge the pressure plate against the wear plate whereby the arm

can be rotated but friction between the wear plate and the disc prevents uncontrolled swinging of the arm.

3,889,830

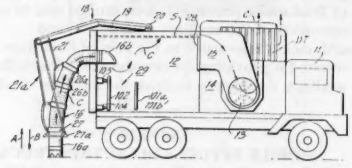
METHOD FOR HANDLING WASTE MATERIAL, REFUSE AND THE LIKE

Joseph F. Bauman, Trenton, and Arthur M. Elson, Hamilton Twp., Mercer County, both of N.J., assignors to Acme-Hamilton Manufacturing Corporation, Trenton, N.J.

Division of Ser. No. 286,573, Sept. 5, 1972, Pat. No. 3,819,069, which is a division of Ser. No. 121,865, March 18, 1971, Pat. No. 3,688,802. This application Nov. 12, 1973, Ser. No. 414,741

Int. Cl. B60p *1/60*

U.S. Cl. 214—152 **1 Claim**



1. A method for extracting refuse from an open-ended refuse container having a base and an air inlet opening near the base to facilitate the passage of air therethrough, comprising the steps of:

providing a flexible vacuum hose having a flanged portion on one end thereof and spaced inwardly therefrom, whereby said one end may be sealed to a wide range of open end shapes and sizes of said refuse container;

coupling the other end of said flexible vacuum hose to a refuse storage container;

positioning the free end of the hose above and upon the open-ended refuse container; and

drawing air from said refuse container to thereby cause the movement of air from the free end of the hose toward said storage container whereby the free end of the hose forms a temporary substantially airtight seal with the top of the refuse container whereby air is drawn into the inlet opening and refuse is extracted from the container, is passed through said hose and is collected in said storage container.

3,889,831

PALLET FOR LARGE COIL OF SHEET MATERIAL AND COOPERATING ROLLER STAND FOR DISPENSING SHEET MATERIAL FROM COIL

Robert L. Davis, Levittown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 2, 1974, Ser. No. 430,350

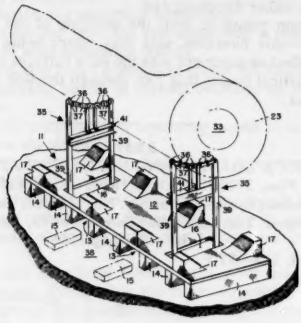
Int. Cl. B21c *47/24*

U.S. Cl. 214—340 **4 Claims**

1. A system for delivering large coils of sheet material and for dispensing said sheet material therefrom, comprising the combination of a pallet and a roller stand, said roller stand having roller means for horizontally supporting said coil,

said pallet comprising a rigid frame adapted to support said coil with the axis of the coil being generally horizontal, said frame having horizontal openings adapted to receive the forks of a lift truck, said frame having at least one vertical opening to allow free passage of said roller means through said pallet when said pallet is lowered over said roller stand, said roller stand receiving the load of said coil upon the lowering of the surface of said pallet below said roller means,

said roller stand having at least one upright member carrying bearing means and said roller means rotatedly mounted at said bearing means, said roller stand adapted to horizontally support said coil with the periphery of said coil in resting contact with said roller means, whereby



said sheet material is dispensed when said coil is axially rotated.

3,889,832

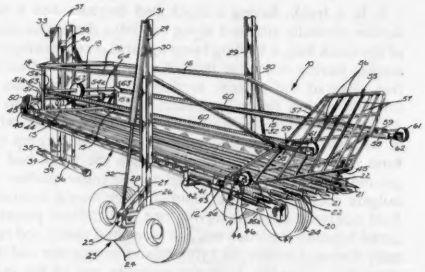
VEHICLE FOR TRANSPORTING HAYSTACKS AND THE LIKE

Howard G. Hanson, Box 408, 1203 Prairie Heights, Larned, Kans. 67550

Filed Dec. 6, 1973, Ser. No. 422,542

Int. Cl. B60p *1/04*

U.S. Cl. 214—514 **6 Claims**



1. A vehicle for transporting formed haystacks and the like, comprising:

a normally horizontally oriented elongate support frame including a bed structure comprised of a plurality of laterally spaced apart elongate tines extending in a fore and aft direction,

a hitch on said frame adjacent the front end thereof and being connectable to a prime mover,

a pair of ground engaging wheel assemblies positioned on opposite sides of and connected with said frame intermediate the ends thereof for supporting the latter for travel over the surface of the ground, cooperating shiftable pairs of elements on said frame and on each of said ground engaging wheel assemblies to permit vertical translation of said frame relative to said ground engaging wheel assemblies between a lowered position and an elevated position, extensible power means connected between said frame and each of said wheel assemblies for elevating said frame relative to said wheel assembles, said frame when in the lowered position being positioned closely adjacent the ground and when urged rearwardly sliding below a haystack supported on the ground, said frame being maintained in a substantially horizontal position during its vertical movement,

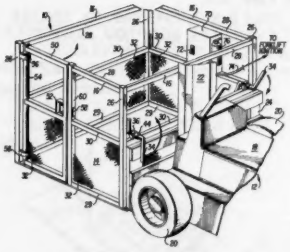
a substantially vertically disposed pusher member shiftably mounted on said frame and being shiftable in a front and rearward direction, longitudinally of said frame from a forward retracted position adjacent the front of said frame to a rearward position adjacent the rear of said frame, said pusher member when shifted from the retracted forward position to the rearward position, progressively unloading a haystack positioned on the frame, power means connected to said pusher member and being mounted on said frame and extending longitudinally thereof, said power means being operable for shifting said pusher member in a forward and rearward direction.

3,889,833

PERSONNEL SAFETY PLATFORM FOR FORKLIFT

Onas Leon Thomas, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Filed Sept. 21, 1973, Ser. No. 399,485
Int. Cl.[2] B65G 47/00
U.S. Cl. 214—620 **7 Claims**



1. A personnel platform for a forklift having lifting forks and an abutting plate, said platform comprising a floor and upstanding side walls, at least one door providing access into said platform, means located beneath said floor for receiving the lifting forks of a forklift, locking means secured to at least one of said side walls adapted to cooperate with the abutting plate of a forklift for releasably securing said platform on the forklift to prevent said platform from sliding off of the forks upon tilting thereof, said locking means including at least one latch means pivotably mounted on said at least one side wall and rotatable about an axis extending substantially parallel to the longitudinal axes of said forks, said latch means being adapted to be rotated upwardly in a vertical plane so as to permit the abutting plate of a forklift to be brought up against said side wall and then rotated downward behind the abutting plate in locking engagement therewith, and wherein said latch means is normally biased in the locking position thereof.

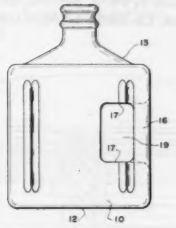
3,889,834

CONTAINER CONSTRUCTION

Robert M. Harris, Jr., Reseda, Calif., assignor to Foremost-McKesson, Inc., San Francisco, Calif.

Filed Oct. 25, 1973, Ser. No. 409,701
Int. Cl. B65d 21/02
U.S. Cl. 215—10 **8 Claims**

1. A container construction suitable for stacking comprising side walls and a bottom wall, the side walls being joined together and to the bottom wall along their edges to form a container that is generally rectangular in configuration as viewed in plan, the container also including upper wall means secured to the upper edges of the side walls and provided with an access opening; and locking means upon two opposite side walls of the container for locking the container to adjacent upper and lower like containers when stacked horizontally, the locking means on each wall comprising adjacent parallel ridge and valley portions formed integral with the material of the wall, said ridge portions interfitting with the valley portions of like containers to prevent shifting movement between



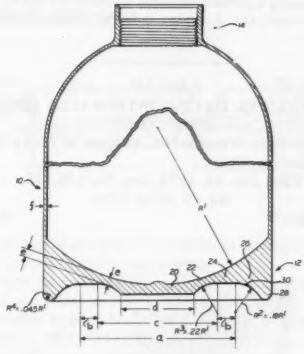
two adjacent stacked containers the major portions of each of the side walls being in a common plane except for said ridge and valley portions.

3,889,835

ONE-PIECE PRESSURE CONTAINER

Richard H. Avant, Rochester, and Peter R. Webster, Greece, both of N.Y., assignors to Bernzomatic Corporation, Rochester, N.Y.

Filed May 10, 1974, Ser. No. 468,962
Int. Cl. F17c 1/14; B65d 1/16, 1/42
U.S. Cl. 220—3 **8 Claims**



1. Pressure container comprising a generally cylindrical body and a self-standing integral bottom having a peripheral skirt portion, said bottom having an inside radius of about R^1 and an exterior configuration which, in vertical cross-section along a diameter line, includes:

i. a disc-like, circular central portion;

ii. a concentric upwardly curved portion contiguous with said central portion and having a radius of about 0.22 R^1;

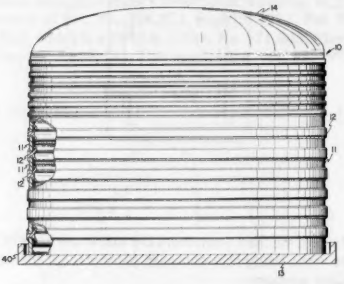
iii. a concentric downwardly curved portion contiguous with the skirt portion and having a radius of about 0.19 R^1; and

iv. a generally flat concentric portion contiguous with and between the curved portions.

3,889,836
METHOD AND MEANS FOR CONSTRUCTING LARGE TANKS

Paul E. Anderson, Torrance, Calif., assignor to Martin Marietta Aluminum, Inc., Torrance, Calif.

Filed Jan. 7, 1972, Ser. No. 216,005
Int. Cl. B65d *87/06, 7/38*
U.S. Cl. 220—5 A 3 Claims

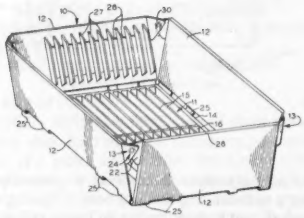


1. A stationary tank comprising a cylindrical vertical wall, a bottom, and a dome, said cylindrical wall comprising a plurality of vertical cylindrical shells comprising horizontal joints between the top and bottom edges of adjacent shells, strips of connector seal means within said joints, said seal means comprising a metal strip having in cross-section outer and inner sleeve means with neck means therebetween, said neck means disposed between said top and bottom edges of adjacent shells, said inner sleeve means comprising upper and lower leg means wherein the end of each leg means is welded circumferentially to respective inner walls of said adjacent shells, at least one of said leg means being flexible and curved thereby defining a pocket between said curved leg means and a said inner wall, and a sealing material disposed within said pocket.

3,889,837
DISH DRAINER HAVING INTEGRALLY HINGED SIDEWALLS

Michael C. Wilson, Wheaton, Ill., assignor to Pretty Products, Inc., Coshocton, Ohio

Filed Jan. 24, 1974, Ser. No. 436,115
Int. Cl. B65d *7/24*
U.S. Cl. 220—7 10 Claims



1. A dish drainer formed from a thermosetting synthetic resin comprising;

a base adapted for positioning on a supporting surface and having at least two adjacent peripheral side edges, said base formed with a plurality of open-topped elongated slots for receiving edge portions of dishes,

at least two sidewalls with each sidewall disposed at a respective side edge of said base, each sidewall interconnected at one edge thereof with the respective peripheral side edge of said base, one of said sidewalls formed with said base along a peripheral side edge disposed transversely to the longitudinal axis of said elongated slots, said last mentioned sidewall having a plurality of upstanding ribs formed in spaced parallel relationship on the inwardly facing surface thereof with the space between adjacent pairs of said ribs disposed in longitudinal alignment with a respective one of said slots,

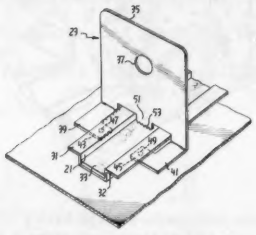
hinge means integrally formed with said base and each of said sidewalls permitting relative swinging movement about a hinge axis parallel to the adjacent interconnected edges between a position in the plane of said base and a position upright thereto, and

fastening means cooperatively interengaging each of said adjacent sidewalls when said sidewalls are disposed in upright relationship to secure said sidewalls together.

3,889,838
SELF-BRAKING FOLLOWER MECHANISM FOR CARD FILES AND THE LIKE

Roy E. Kanitz, Belpre, Ohio, assignor to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 7, 1973, Ser. No. 330,302
Int. Cl. B65d *1/24, 25/06*
U.S. Cl. 220—22.3 6 Claims



1. A file drawer self-braking follower mechanism for maintaining cards and the like generally vertically oriented one behind another, comprising:

a follower guide of generally U-shaped cross-section located at the bottom of the drawer and extending parallel to the front to rear axis of the drawer;

an elastomer strip having a surface which is even in the longitudinal direction and disposed along a trough of the U-shaped follower guide; and

a generally vertically oriented follower plate mounted on said follower guide for slideable motion along the follower guide and having a plurality of braking teeth on the bottom edge for impinging into the top even surface of the elastomer strip so that the follower plate can be secured at any position along the follower guide.

3,889,839
BLOW-MOLDED DRUM

Alvin L. Simon, and Klaus S. Butz, both of Los Angeles, Calif., assignors to Advanced Chemical Technology, Los Angeles, Calif.

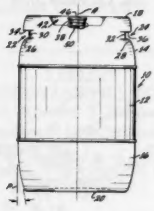
Filed May 30, 1974, Ser. No. 474,797
Int. Cl. B65d *7/42*
U.S. Cl. 220—72 30 Claims

1. A blow-molded drum of thermoplastic material comprising:

an extended drum body having a circumferential wall and top and bottom sections,

said circumferential wall having at least two integral overhanging brow portions positioned respectively on opposite sides of said circumferential wall of said body, each of said brow portions overhanging a corresponding clear

and open volume adjacent said circumferential wall sufficiently large to permit insertion of the forks of a fork lift beneath the overhanging brows,



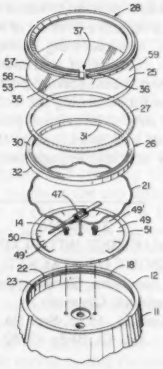
said overhanging brow portions having bottom surfaces adapted to serve as bearing and lifting surfaces for lifting and transporting of said drum by the forks of a fork lift.

3,889,840

GAGE CONSTRUCTION AND SPACING MEMBER THEREFOR OR THE LIKE

Larry V. Price, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Oct. 2, 1973, Ser. No. 402,707
Int. Cl. B65d *25/54*; G01d *11/26*
U.S. Cl. 220—82 A **8 Claims**



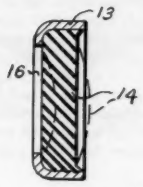
2. In combination, an instrument casing having an end wall means and an opening therein leading to said end wall means, a sealing member carried by said casing adjacent said opening thereof, a lens disposed in said opening and having one side of its outer periphery disposed against said sealing member, a lens ring means disposed against the other side of the outer periphery of said lens to hold said lens in said opening, said lens ring means having an interlocking part thereof disposed against the outer peripheral edge means of said lens between said sides thereof to lock said lens ring means to said casing, and a spacing member in said opening between said sealing member and said end wall means, said spacing member having an annular groove means therein that faces said end wall means, and a wavy spring disposed in said annular groove means and being in engagement with said end wall means to normally hold said spacing member spaced from said end wall means while permitting said spacing member to be moved toward said end wall means through the compressing of said wavy spring whereby said spring is adapted to be compressed and cause said spacing member to maintain said sealing member in sealing engagement with said one side of said lens.

3,889,841

LEAK AND CORROSION RESISTANT, YIELDABLE FREEZE PLUG

William H. Edmonds, Quanah, Tex., assignor to J. L. Quisenberry, Quanah, Tex.

Filed Nov. 28, 1972, Ser. No. 310,160
Int. Cl. B65d *35/44*
U.S. Cl. 220—200 **5 Claims**



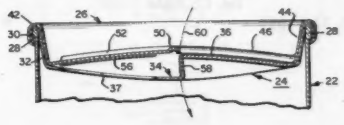
1. In combination with a metal, cupped freeze plug,
a. an elastomer material bonded within the cupped portion of the freeze plug,
1. the cupped metal portion of the freeze plug is in the form of a disc, and
2. the cupped portion of the disc is completely filled with an elastomer material.

3,889,842

CONTAINER CLOSURE OPENING MEANS

Robert A. Bennett, 170 Sturbridge Rd., Easton, Conn. 06425

Filed May 20, 1974, Ser. No. 471,331
Int. Cl. B65d *51/18*
U.S. Cl. 220—253 **25 Claims**

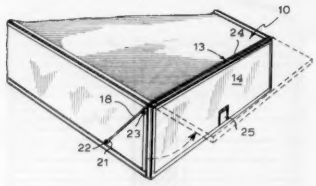


1. A closure apparatus for a container having an open end, circular in cross-section, comprising:
A. A first lid peripherally mounted to at least a portion of said open end and incorporating a central portion depressable from a first closed position to a second open position; said central portion incorporating;
1. at least one orifice defining region; and
2. a manually depressable raised button; and
B. A second lid mounted for rotation with respect to said first lid incorporating a central portion is juxtaposed relationship to the central portion of said first lid incorporating an opening with a configuration allowing the raised button of said first lid to protrude therethrough when the central portion of said first lid is in the closed position thereby preventing rotation of said second lid about said first lid; whereby the closure apparatus closes the container when the central portion of said first lid is in the closed configuration and opens the container by generating an orifice in each orifice defining region of the central portion of said first lid when said button is depressed thereby allowing rotation of said second lid about said first lid to align said opening with at least one of said orifices.

3,889,843
MULTI-POSITION DOOR AND HINGE

Matthew N. Miller, Woodland Hills, Calif., assignor to Fairchild Industries, Inc., Germantown, Md.

Filed Jan. 18, 1974, Ser. No. 434,380
Int. Cl. B65d 43/14, 51/04
U.S. Cl. 220—332 8 Claims

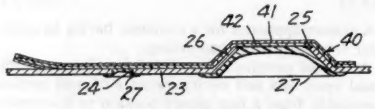


1. A receptacle with a multi-position door and hinge device comprising a receptacle having an opening to permit access to the interior thereof, a door adapted to cover the opening of said receptacle, and means operatively connected to said receptacle and to said door for permitting said door to be selectively rotated and displaced to expose the receptacle opening and for permitting the inner or the outer surfaces of said door to alternatively contact an outer surface of said receptacle when the opening of said receptacle is uncovered.

3,889,844
CAN CLOSURE

Harris W. Viker, Roseville, and William E. Kropp, North St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 30, 1973, Ser. No. 393,001
Int. Cl. B65d 41/00
U.S. Cl. 220—359 6 Claims



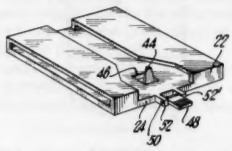
1. In a closed hollow container wherein a pour hole in the container wall is protectively covered by a tape removably adhered to the outer surface of the wall in the area immediately circumjacent to the pour hole,

the improvement which comprises contouring said area so that the wall uniformly tapers outward and the hole is thus located in a plane displaced outward with respect to the portion of the wall peripherally adjoining said area, the tape being adhered to the tapered portion of the wall, whereby, without causing the tape to loosen, the container can be subjected to substantially higher internal pressure than is possible when the hole is located in the same plane as the immediately circumjacent area.

3,889,845
MARKER STRIP DISPENSER

Louis F. Haitmanek, Florham Park, N.J., assignor to Thomas & Betts Corporation,-Elizabeth, N.J.

Filed Feb. 11, 1974, Ser. No. 441,157
Int. Cl. B65h 5/28
U.S. Cl. 221—70 10 Claims

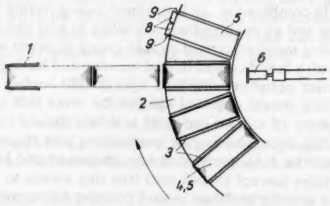


1. A device for selectively positioning a marker strip for removal from a backing web containing a plurality of such strips, comprising: a body member having web support means comprising a first portion and a second portion, said first and said second portions being arranged in selectively spaced relationship to define a web receiving passageway therebetween, a dispensing zone adapted to permit the removal of said marker strip from said web, said dispensing zone extending essentially across the width of said web receiving passageway and communicating therewith, said dispensing zone comprising an opening adapted to receive said marker strip therethrough; and a strip deflector extending selectively from said web support means first portion towards said dispensing zone to planarly deflect a selective portion of said marker strip out of the plane of said web receiving passageway and into said dispensing zone for removal of said marker strips from said web; said web support means second portion further comprising camming means for returning the deflected portion of an unremoved marker strip to its original position upon the selective advancement of said marker strip through said web receiving passageway and into engagement with said camming means.

3,889,846
LABELING MACHINE WITH CONTAINER FOR TRANSPORT OF STACKED LABELS

Hans Josef Strack, Monheim, Germany, assignor to Jagenberg Werke AG, Dusseldorf, Germany

Filed Nov. 21, 1973, Ser. No. 418,140
Int. Cl. B65g 47/82
U.S. Cl. 221—79 6 Claims



1. In a labeling machine including a magazine from which labels are dispensed for labeling, a stack of labels, means for delivering said stack of labels from a position of readiness to said magazine, and means for advancing said stack from a stand-by position to said position of readiness, the improvement which comprises a container for each stack of labels in said stand-by position, said container in part having the same shape as said label stack, having opposite ends and being provided at least at its end facing said magazine with separable

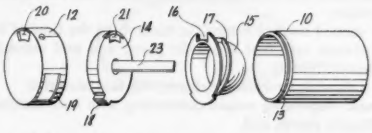
end flaps, whereby upon actuation of said means for delivering said stack from said position of readiness to said magazine said separable flaps separate to permit delivery of said stack of labels which stack leaves said container while said container stays in said position of readiness, said similar shapes providing sliding guided contact of said stack relative to said container.

3,889,847

CHILD-RESISTANT PILL DISPENSER

Miroslav Uroshevich; Richard T. Powers, and Raymond L. Sperber, all of Cincinnati, Ohio, assignors to The AFA Corporation, Miami Lakes, Fla.

Filed Nov. 1, 1973, Ser. No. 411,946
Int. Cl. B65h *3/36*
U.S. Cl. 221—265 **1 Claim**



1. A dispenser container for tablets comprising, in combination, a container having a circular open end and a closed end, a guide plug freely rotatable in said open end and closing said open end except for a port extending through said plug and sized to permit passage therethrough of one tablet at a time, a dome on said plug extended into the interior of said container, a helical ramp on said dome leading to the port in the plug, a rotor rotatably mounted in juxtaposition to said plug and including a chamber adapted to receive a tablet, means including a thumbpiece for rotating said rotor from a first position with respect to the plug where said chamber and said port are sufficiently in register to permit passage of a tablet therebetween to a second position with respect to the plug where said chamber and port are out of register sufficiently to prevent passage of a tablet therebetween, a cap rotatably mounted to the container and covering both the plug and the rotor except for slot means in the cap through which the rotor rotating thumbpiece is extended and is free to allow movement of the rotor to the first and second positions, means preventing relative rotation between the cap and the plug, a port through said cap adapted to come into register with the chamber in the rotor only when the rotor is moved to the second position and sufficiently in register to allow passage of a tablet therebetween, and a torsion bar spring extended between the rotor and the plug and non-rotatably mounted in each of them with the spring biasing the rotor so that it returns to the said first position but allows easy rotor movement to the second position.

3,889,848

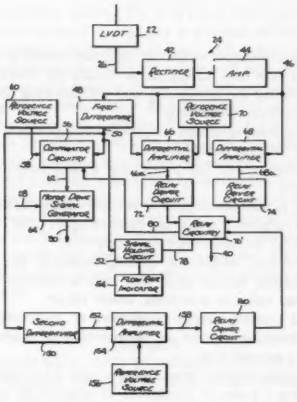
AUTOMATICALLY CONTROLLED WEIGH FEEDING APPARATUS

Ronald J. Ricciardi, 193 MacArthur Ave., Garfield, N.J. 07026, and Angelo Ferrara, 7 Bryn Mawr, Fairfield, N.J. 07006

Continuation-in-part of Ser. No. 274,844, July 25, 1972, abandoned. This application Mar. 28, 1973, Ser. No. 345,587
Int. Cl. G01g *11/14*
U.S. Cl. 222—58 **9 Claims**

1. Apparatus for feeding particulate solid material comprising, a container for a quantity of said particulate solid material, an auger type discharge device for discharging material from said container, a conduit for receiving material from said auger type discharge device, a motor, a gear-reduction device for connecting said motor to said auger type discharge device, a scale, said container and auger type discharge device and conduit and motor and gear-reduction device being mounted on said scale, means coupled to said scale for producing an electrical signal proportional in amplitude to the weight determined by said scale; differentiator circuit means having an output terminal and having an input coupled to said electrical signal means, wherein said differentiator circuit means is for differentiating said electrical signal to provide a rate signal at said output terminal which is proportional in amplitude to the discharge rate of said substance from said container; control signal generating means having an output terminal, and having an input terminal connected to said differentiator circuit means output terminal, wherein said control signal means is for generating at its output terminal a discharge control signal which is a function of the amplitude of said rate signal; and means coupled between said control signal generating means output terminal and said motor for controlling the discharge rate of said auger type discharge device in response to said discharge control signal,

said means for producing said electrical signal being a linearly variable differential transformer, said control signal generating means including a reference signal source, a comparator having first and second inputs connected



respectively to said reference signal source and said differentiator circuit means output terminal, and having an output for providing a comparison signal in response to said signals from said reference source and differentiator circuit means, and motor drive signal generating means having an input connected to said comparator output, and having an output which provides said discharge control signal for controlling the speed of said motor,

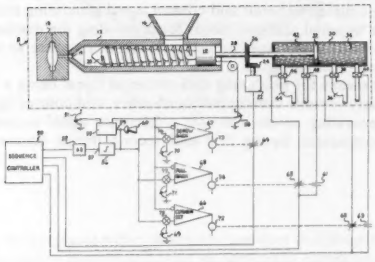
said motor comprising a DC motor; said motor drive signal generating means including rectifying bridge circuit means connected to said motor for converting an AC signal to said discharge control signal for driving said motor, said bridge circuit means including a pair of SCR's having respective gate electrodes and in which said generating means further includes pulsing circuit means having a pair of output means connected to said respective SCR gate electrodes to operate said SCR's to control said discharge control signal by controlling the rectification of said AC signal, and having an input which comprises said input for said motor drive signal generating means.

3,889,849

SHOT VOLUME AND CUSHION POINT CONTROL FOR INJECTION MOLDING APPARATUS

Robert F. Chandler, Jr., Roanoke, Va., assignor to General Electric Company, Salem, Va.

Filed Dec. 26, 1973, Ser. No. 427,799
Int. Cl. B29f 1/02
U.S. Cl. 222—63 **13 Claims**



1. A control system for an injection molding machine including a ram and having drive means for rotating, and hydraulic means for advancing and withdrawing said ram, said control system comprising:

position sensing means for producing a position signal indicative of ram position;

reference means for producing a first position reference signal;

circuit means connected to receive said position signal and said reference signal for producing an error signal representing the difference therebetween;

first control means for causing pressure applied by said hydraulic means upon said ram to decline from a first, higher value to a second, lower value;

second control means responsive to said error signal for establishing a point for termination of operation of said drive means; and

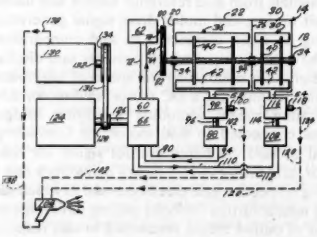
third control means responsive to said error signal for establishing a point of maximum withdrawal of said ram.

3,889,850

TEXTURE AND ACOUSTIC SPRAYING EQUIPMENT

Delbert K. Whitt, Kent, Wash., assignor to Pete Whitt, Inc., Kent, Wash.

Filed Apr. 21, 1971, Ser. No. 135,859
Int. Cl. B67d 5/52
U.S. Cl. 222—135 **4 Claims**



1. An apparatus for flowing a material comprising a liquid and a solid to a desired location, said apparatus comprising:

a. an agitation tank;

b. a first agitator in said tank;

c. a first hydraulic pump;

d. a first hydraulic motor;

e. said pump being in a driving relationship with respect to said motor for flowing liquid from said pump to said motor;

f. said motor being in driving relationship with said agitator;

g. a second hydraulic motor;

h. said first hydraulic pump connecting with said second hydraulic motor in a driving relationship for flowing liquid from said first hydraulic pump to said second hydraulic motor;

i. a second hydraulic pump connecting with said tank to move said material with respect to said tank;

j. said second hydraulic motor connecting with said second hydraulic pump in a driving relationship;

k. a first control means for controlling the flow of liquid between said first hydraulic pump and said first hydraulic motor;

l. a second control means for controlling the flow of liquid between said first hydraulic pump and said second hydraulic motor;

m. a dispenser means for dispensing said material;

n. said dispensing means connecting with said second hydraulic pump; and,

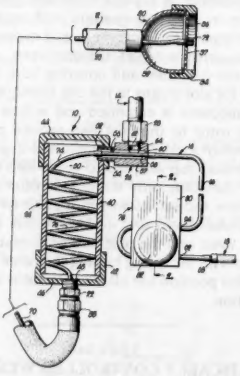
o. a third control means juxtapositioned to said dispensing means for controlling the flow of liquid between said first hydraulic pump and said second hydraulic motor.

3,889,851

SHAMPOO DELIVERY ASSEMBLY

Philip Kain, 9649 Chadwick, Leawood, Kans. 66206

Filed Apr. 5, 1974, Ser. No. 458,336
Int. Cl. B67d 5/62
U.S. Cl. 222—146 HS **6 Claims**



1. A shampoo dispensing system for use in beauty salons or the like, said system comprising:

a source of liquid shampoo;

a source of heated water;

a unitized, selectively shiftable fluid flow directing means coupled with said shampoo source and said water source for simultaneously delivering shampoo and water to a common point of usage;

said flow directing means including a first conduit for water and a second conduit for shampoo, there being respective nozzle means at a distal end of each conduit for discharging shampoo and water from said flow directing means in individually distinct, unmixed streams,

said second conduit having at least a portion thereof disposed within said first conduit and surrounded by the water therein whereby the shampoo in said portion is pre-

warmed to a temperature approaching that of said water as the latter flows through said first conduit; and

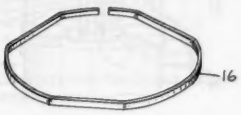
a selectively actuatable on-off control device operably coupled with said second conduit to independently control the flow of said shampoo therethrough for selectively dispensing a discrete quantity of pre-warmed shampoo at said point of usage concurrently with the delivery of a quantity of water.

3,889,852

CONTAINER SAFETY DISPENSING CLOSURE

Peter Strefford, 85 South Dr., Toronto, Ontario, Canada

Filed Aug. 6, 1973, Ser. No. 385,851
Int. Cl. B67d *5/32*
U.S. Cl. 222—153 **10 Claims**



1. A container safety dispensing closure comprising:

a. a hollow outer cap having a generally cylindrically shaped outer wall and a flat top, the wall having an inwardly opening circumferential slot on a lower portion thereof, the outer cap adapted to be securely fixed to the container by a retaining ring cooperatively received by said slot and a matching outwardly opening circumferential slot on the container, the wall having a first dispensing aperture extending therethrough substantially diametrically opposite a seat opening, the flat top having a circular central hole extending therethrough;

b. a hollow generally cylindrically shaped inner cap rotatably received within the outer cap in sliding contact with an upper rim of the container, the inner cap having a second dispensing aperture adapted to be aligned with the first dispensing aperture in the outer cap, the inner cap having a circular seat located beneath the circular hole in the top of the outer cap, the circular seat being smaller in diameter and in eccentric alignment with the circular hole, the inner and outer caps adapted to be engaged by a separate wall mounted opening tool having a manually rotatably cylindrical shaft with a smaller diameter cylindrical boss eccentrically located on one end thereof, the said circular seat adapted to receive the said end of the shaft and the circular seat adapted to receive the eccentric boss in an engaged position wherein manual rotation of the shaft correspondingly rotates the inner cap within the outer cap whereby the inner cap may be rotated from a closed position wherein the second dispensing aperture is covered by the wall of the outer cap to an open position wherein the first and second dispensing apertures are in alignment, thereby providing a passage for dispensing of the contents of the container by tilting the container, the inner cap having a flat vertical outer segment radially opposite the second dispensing aperture;

c. a torsional spring located between the inner and outer caps with one end engaging the inner cap and the other end engaging the other cap whereby the inner cap is subjected to a continuous rotational bias towards the closed position;

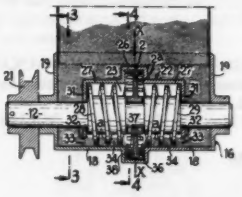
d. a pushbutton member horizontally reciprocatingly received in the seat opening in the outer cap, the pushbutton member having a flat inner surface adapted to be brought into bearing contact with the flat outer segment of the inner cap by depressing the pushbutton member to manually retain the inner cap in the open position following disengagement of the opening tool, the torsional spring immediately returning the inner cap to the closed position upon release of the pushbutton member.

3,889,853

DISTRIBUTING APPARATUS FOR AGRICULTURAL PURPOSES

Edmond Ribouleau, Largeasse 79, 240 L'Absie, France

Filed Mar. 20, 1974, Ser. No. 453,167
Claims priority, application France, Mar. 21, 1973, 73.10071
Int. Cl. A01c *15/00*
U.S. Cl. 222—177 **14 Claims**



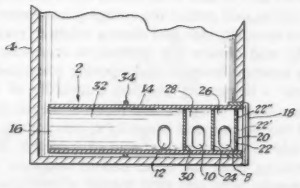
1. An apparatus for distributing pulverulent or granular material over a ground, comprising a hopper for the material, at least one Archimedean screw mounted to rotate about an axis in a lower part of the hopper, a distributor wheel adjacent an output end of the screw and combined with the screw, a hooding completely closing the screw and wheel off from the interior of the hopper except for a portion of the hooding which has a lower edge which defines with a bottom portion of the hopper an opening located below said axis, the hooding defining with a side portion of the hopper a passage putting the opening in communication with the interior of the hopper above the hooding, the opening being adjacent an input end of the screw opposed to said output end and allowing the material in the passage access to the wheel by way of the interior of the hooding in a region adjoining the bottom portion of the hopper, a spout for directing the material onto the ground, the spout having an input orifice communicating with the inside of the hooding and positioned to cooperate with the wheel for transferring the material from the wheel to the ground by way of the spout, and means for rotating the screw and the wheel.

3,889,854

MEASURING AND DISPENSING DEVICE

Rudolph A. Gagnon, and Ann K. Matt, both of 2 Aster Terr., Key West, Fla. 33040

Filed Feb. 19, 1974, Ser. No. 443,737
Int. Cl. G01f *11/18*
U.S. Cl. 222—284 **4 Claims**



1. A measuring and dispensing device connected to a container for sprinkling a quantity of material from a container, for pouring a measured quantity of material from the container, and for pouring an unmeasured quantity of material from the container comprising:

a generally cylindrical body rotatably connectable to the container for reciprocal movement into and from the container along a longitudinal axis, said cylindrical body having an open lower end and including,

a first baffle connected across the upper end of said cylindrical body,

a second baffle connected across said cylindrical body spaced from and below said first baffle to enclose and form a first compartment, said second baffle forming a second compartment below said first compartment, and said cylindrical body including perimeter portions about an opening into the first and second compartments for filling and dispensing material in the container.

3,889,855

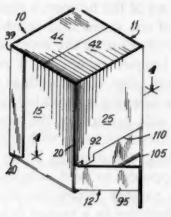
DISPENSING AND METERING PACKAGE

Richard Paul Mommer, Loveland, Colo., assignor to Balcom Chemicals, Inc., Greeley, Colo.

Filed May 30, 1973, Ser. No. 365,168

Int. Cl. G01f *11/10*

U.S. Cl. 222—355 **8 Claims**



1. A dispensing and metering package comprising a bottom wall, a side wall upstanding circumferentially about said bottom wall, there being a cutout in a lower region of said side wall, a false bottom spaced over said bottom wall above the level of said cutout and having a through opening adjacent to said cutout, strut means depending from said false bottom into bearing engagement with said bottom wall for supporting said false bottom, a closure hingedly connected by a generally vertical fold axis to said strut means and extending in closing relation across said cutout for swinging movement outwardly out of and inwardly into said closing relation, receiver means carried by said closure for movement therewith between a receiving position beneath said opening when said closure is closed and a dispensing position outwardly of said cutout when said closure is open, said receiver means comprising a first wall having one end hingedly connected by a generally vertical fold to said closure at said strut means, and a second wall extending from the other end of said first wall to said closure remote from said strut means, whereby said first and second receiver walls combined with said closure to define a generally triangular configuration for receiving contents through said opening; and a valve element carried by said receiver means for movement therewith between an open position facing said false bottom when said closure is closed and a closed position across said opening when said closure is open, whereby fluid material above said false bottom is retained by said valve element when said receiver means is extended to dispensing position and gravitationally passes to said receiver when the latter is in receiving position.

3,889,856

DISPENSING CAP FOR VALVED, PRESSURIZED CONTAINER

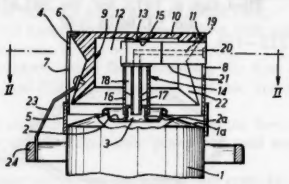
Bruno Morane, Paris, France, assignor to Societe Anonyne dite: L'Oreal, Paris, France

Filed Feb. 7, 1972, Ser. No. 223,940

Claims priority, application France, Mar. 12, 1971, 71.08656

Int. Cl. B65d *83/14*

U.S. Cl. 222—402.13 **10 Claims**



1. A cap for use with a pressurized container of the type equipped at its upper end with a dispensing valve actuated by the axial depression of an outlet tube against the resistance of resilient means, said cap comprising

a stationary cylindrical guide cylinder attached to the upper end of said container coaxially of said outlet tube,

an L-shaped dispensing member having a vertical arm comprising an outer sleeve vertically slidable on and guided by said guide cylinder and an inner duct slidable with said sleeve and positioned to engage said outlet tube to receive a product emitted therethrough, said dispensing member comprising a horizontal arm defining a horizontal duct in communication with the duct in said vertical arm,

an annular member encircling said dispensing member and attached to said container, said annular member being provided with inwardly projecting flange means, a depending lateral wall and an opening in said wall aligned with said horizontal arm,

and a cover member having peripheral portions spaced in all directions from its center which are engaged beneath said inwardly projecting flange means, said cover having its center pivotally mounted on a point on said dispensing member in alignment with the axis of said outlet tube for swinging movement about said flange means as a fulcrum toward and away from said container,

whereby depression of said cover member at any point remote from its center causes depression of the center of said cover and the vertical dispensing member arm and outlet tube therebeneath, to open said valve and dispense the contents of said container.

3,889,857

CANTILEVERED DRAPERY PROCESSING MACHINE

Vernon D. Clement, 8050 Westboro Way, Sacramento, Calif. 95823

Filed Oct. 23, 1974, Ser. No. 517,170

Int. Cl. A41h *43/00*; D06j *1/00*

U.S. Cl. 223—32 **12 Claims**

1. A drapery processing machine comprising:

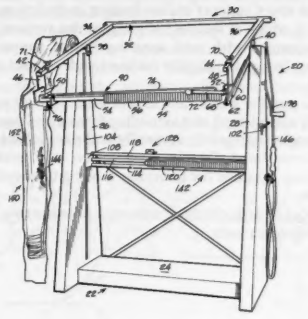
a base unit having two spaced-apart members;

a frame pivotally mounted to the spaced-apart members;

drapery support means operable to secure the top folds of a drapery, said drapery support means being connected with said frame to swing generally therewith to a lower position upon pivoting of the frame in one direction, and to an upper position upon pivoting of the frame in the

other direction; and

means for selectively securing the frame relative to the



spaced-apart members with the drapery support means in said upper position.

3,889,858

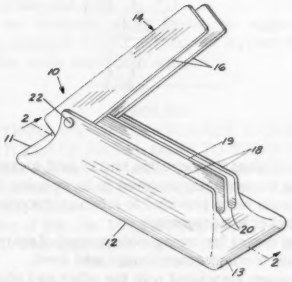
PLEAT-FORMING DEVICE

Vila L. Hack, East Detroit, Mich., assignor to Kurt & Mold & Die Co., Mt. Clemens, Mich.

Filed Oct. 4, 1971, Ser. No. 186,192

Int. Cl. A41h *43/00*; **D0bj** *1/00*

U.S. Cl. 223—35 **1 Claim**



1. A pleat-forming device comprising a rectangular base with three parallel horizontal spacers extending vertically therefrom, said spacers being of rectangular configuration, the top of the center spacer being slightly elevated above the tops of the two outward spacers, a pleater arm comprised of two connected pivotable parallel spacers, a horizontal pivot comprising a rivet extending through the rear top corners of the three lower spacers such that when lowered the upper spacers interdigitate with the lower spacers, so that fabric to be pleated is first folded over the middle lower spacer permitting accurate pleat spacing and free movement of fabric prior to making further pleats therein.

3,889,859

PACK FRAME AND SACK THEREFOR

Mark T. Joseph, Denver, Colo., assignor to Samsonite Corporation, Denver, Colo.

Filed June 14, 1973, Ser. No. 369,961

Int. Cl. A45f *3/00*

U.S. Cl. 224—8 R **3 Claims**

1. A pack frame comprising:

a pair of side bars and transverse bars connecting said side bars, including an upper transverse bar adapted for the attachment of the upper ends of a pair of shoulder strap means;

a forwardly extending hip member attached to each side bar at a lower position and adapted to extend forwardly to a position alongside a hip of a user, each hip member being provided with a rear post and a forwardly extending arm;

means for attaching said hip member to the corresponding side bar with said post extending either upwardly or downwardly;

a pair of shoulder strap means attached at the upper ends thereof to said upper transverse bar;

a hip strap means constructed and arranged to encircle the hips of said user;

means for connecting the lower end of a shoulder strap means and one side of said hip strap means to the corresponding hip member alongside each said hip of said user;

joints for attaching each hip member to the corresponding side bar, each joint having spaced upright apertures for engaging said side bar and said post, respectively, said post having a series of vertically spaced holes at different angles to the direction of said arm and said side bar having a series of vertically spaced holes;

removable pin means for extending alternatively through said holes of said post for attaching said post to said joint at different angular positions; and

removable pin means for extending alternatively through said holes in said side bar for attaching said joint to said side bar at different vertical positions.

3,889,860

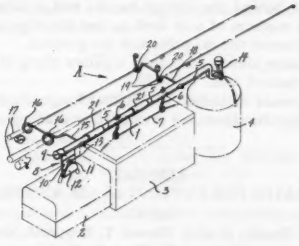
FISHING GEAR CARRIER

Albert E. Lindsey, 12 Roberta Dr., Caseyville, Ill. 62269

Filed May 25, 1973, Ser. No. 363,891

Int. Cl. A45c *13/26*

U.S. Cl. 224—45 R **10 Claims**



1. In a fishing gear carrier of the type providing for conveyance of a plurality of items of fishing accessories such as a tackle box, bait bucket, fishing rod, and the like, comprising, a rod member having a length to provide for accommodating the suspension of such gear along its length, a bracket means

provided at each end of said rod member for supporting such gear, said rod member capable of accepting additional attachment means along its length for supporting other of said fishing accessories, bracket means at least at one end including an upper portion being secured to said rod member, a lower portion of said bracket having a turned up end and being connected to said upper portion, locking means pivotally connecting with said lower portion of the bracket, said locking means provided for securing an item of fishing gear within the turned up end of the lower portion during accessory conveyance and including attachment means for supporting at least one fishing rod upon said rod member during its conveyance, said means comprising a pair of rods extending laterally from said rod member, each projecting rod having at least one loop formed therein whereby said fishing rod may be coupled adjacent to said loops and supported during conveyance of the gear carrier.

3,889,861

TRANSPORT CONTAINER FOR SKIS AND POLES

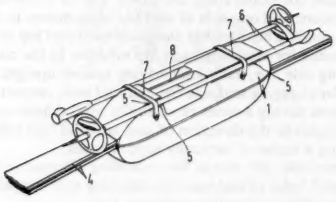
Hans Fihn, Geretsried, Germany, assignor to Weikal Plastik GmbH & Co. Kunststoffprodukte KG, Neukolbing, Germany

Filed Mar. 22, 1974, Ser. No. 453,735

Claims priority, application Germany, Mar. 23, 1973, 7311073

Int. Cl. B65d *71/00*

U.S. Cl. 224—45 S **1 Claim**



1. A device for transporting a pair of skis and ski poles, the skis having their running surfaces in abutment comprising:

two elongated rigid shells for encompassing the central portion of the skis, wherein one of said two shells includes a carrier handle being formed by a recess in the surface of that shell between the front and heel portion of the binding of the ski, said shell having the carrier handle also including at its two upper outer edges, groove-shaped recesses for accommodating the ski poles on either side of the carrying handle and holder clips disposed in front of and behind the carrier handle and attached to the lateral surfaces of said shell so that the clips can be secured across the ski poles and the grooves,

hinge means joining said shells together along at least one edge thereof; and,

closing means mounted on a further longitudinal edge for encasing the skis in the area of their bindings.

3,889,862

APPARATUS FOR CUTTING GLASS AND PLASTIC SHEET

Thomas A. Insolio, Bristol; Vincent T. Kozyrski, New Britain, and Edward J. Witkoski, Burlington, all of Conn., assignors to The Fletcher-Terry Company, Farmington, Conn.

Filed Aug. 22, 1974, Ser. No. 499,457

Int. Cl. C03b *33/02, 33/10*

U.S. Cl. 225—96.5 **13 Claims**

1. Apparatus for scoring fracture sensitive sheet material comprising:

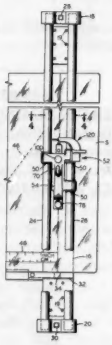
a. support means for the sheet including a horizontally extending squaring bar adapted to engage a lower edge of the sheet to be scored,

b. said sheet support means further including an elongated anvil which is inclined slightly to the vertical and which cooperates with said squaring bar to support a planar sheet in a plane slightly inclined with respect to the vertical,

c. two parallel guide rails supported in spaced parallel relation to said anvil and extending from a position below said squaring bar gently upwardly and parallel said anvil,

d. a cross head slidably mounted on said guide rails and having a handle for manually moving the head along said rails,

e. a rocker arm pivotally mounted in said cross head intermediate its ends,



f. scoring means adjacent one end of said rocker arm, said scoring means being received in an opening in said arm and means being provided to retain said scoring means in said rocker arm opening,

g. biasing means for urging said one end of said rocker arm and said scoring means toward said anvil,

h. stop means associated with the other end of said rocker arm to limit the movement of said scoring means toward said anvil, and

i. a lever adjacent said handle and pivotally movable in said head generally toward said handle in response to a manual squeezing action, said lever including a projecting portion engageable with said arm to permit moving said scoring means away from said anvil when manually moving said head in a return direction opposite a scoring direction.

3,889,863

STRIPPING MACHINE

Clovis F. Deslauriers, 25-52 Borough Pl., Woodside, N.Y. 11377

Filed Mar. 30, 1973, Ser. No. 346,337

Int. Cl. B26f *3/00*

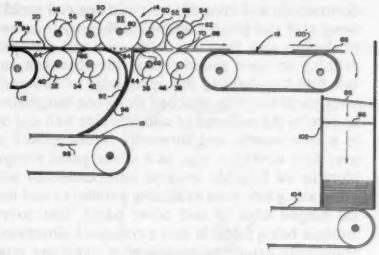
U.S. Cl. 225—99 **6 Claims**

1. In a stripping machine suitable to separate the waste material from the finished product in previously die cut sheets, the combination of

A. feed conveyor means to carry the die cut sheets rearwardly through the machine in a generally horizontal plane;

B. stripping means receiving the die cut sheets from the waste conveyor means to remove the waste material,

1. said stripping means including roller means to convey the die cut sheets rearwardly through the machine,
   a. said roller means having nips in alignment with the said horizontal plane,
2. said stripping means comprising a rotating stripping shaft and a plurality of transversely spaced, rotating, transversely adjustable, circular stripping blades mounted upon the stripping shaft and being rotated thereby,
   a. said stripping blades including a bottom periphery which extends below the said horizontal plane,



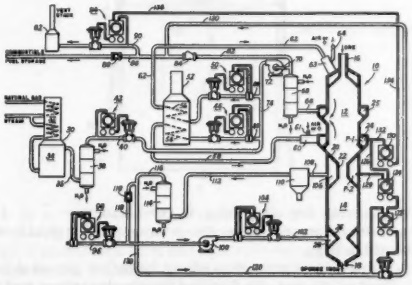
   b. the said finished product being carried rearwardly by the roller means in the horizontal plane intermediate the spaced stripping blades,
   c. the stripping machine defining an open area below the stripping blades whereby the waste material is urged downwardly through the open area to a point of disposal, and
   d. the stripping means having no support structure positioned below the sheets to support the sheets as the waste material is separated.

3,889,864

METHOD AND APPARATUS FOR REDUCING PARTICULATE METAL ORES TO SPONGE IRON

Juan Celada; Patrick W. MacKay, and Ramon de la Pena, all of Monterrey, Mexico, assignors to Fierro Esponja, S.A., Monterrey, Mexico

Division of Ser. No. 189,560, Oct. 15, 1971, Pat. No. 3,779,741. This application Sept. 6, 1973, Ser. No. 394,843
Int. Cl. F27b *1/00*
U.S. Cl. 266—24 **4 Claims**



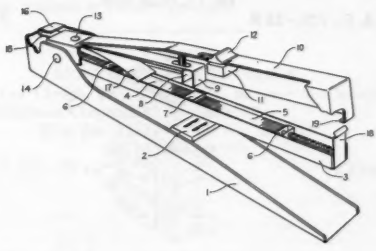
1. Apparatus for reducing a particulate metal ore to metal particles in a vertical shaft, moving bed reactor having a reduction zone in which a hot reducing gas is caused to flow through a portion of said bed to reduce the metal ore thereof to metal, comprising in combination with said reactor, a first conduit connected to said reactor near the middle of said reduction zone, a second conduit connected to said reactor near the top of said reduction zone and to said first conduit at a point spaced from said reactor, a third conduit connected to said reactor near the bottom of said reduction zone and to said first conduit at a point spaced from said reactor, said first and second conduits and the upper portion of said reduction zone forming a first gas flow loop and said first and third conduits and the lower portion of said reduction zone forming a second gas flow loop, pump means in said first conduit for pumping gas therethrough, heating means in said loops for heating the gas flowing therethrough, valve means in at least one of said second and third conduits for regulating the gas flow therethrough, a source of make-up reducing gas outside said loops, conduit means connecting said make-up gas source to said first conduit on the discharge side of said pump means, and venting means connected to said first conduit on the suction side of said pump means for venting a portion of the gas flowing through said loops.

3,889,865

DUAL STAPLER

Ned Robert Kuypers, 432 Covington Rd., Los Altos, Calif. 94022

Filed Dec. 6, 1973, Ser. No. 422,571
Int. Cl. B25c *5/02*
U.S. Cl. 227—109 **15 Claims**



1. A dual stapler comprising:
common supply means for simultaneously holding two cartridges of wire staples and feeding those cartridges along a common axis of the supply means to a pair of driving locations of the supply means to define a prescribed dual staple pattern;
dual anvil means mounted adjacent to the supply means for clinching two wire staples driven thereagainst from the driving locations of the supply means;
dual driver means mounted adjacent to the supply means for driving a pair of wire staples positioned at the driving locations of the supply means in the prescribed dual staple pattern against the dual anvil means to form a dual staple joint; and
actuator means for receiving an actuation force to actuate the dual driver means.

3,889,866

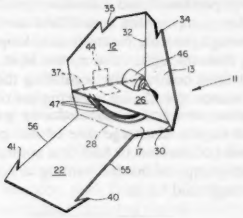
CONTAINER MEANS

John Ansley Keller, Creamery, Pa., assignor to Heavy Light Mfg. Corp., Fairview Village, Pa.

Filed May 13, 1974, Ser. No. 469,168
Int. Cl. B65d *5/00, 5/58*
U.S. Cl. 229—22 **10 Claims**

1. Unassembled container means comprising at least four sections, including:
   a. a first pentagonal section, a second pentagonal section and a third pentagonal section, in which the first and second pentagonal sections have a common side and in which the second and third pentagonal sections have a common side; and
   b. a T-shaped section, said section being connected to the first pentagonal section, wherein said T-shaped section

contains means for interconnection with the second and third pentagonal sections, respectively, such that when



the sections are folded along their respective boundaries a right angle pyramid shaped container is formed.

3,889,867

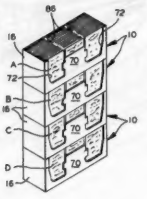
DISPLAY CARTON

Robert A. Berg, Chicago, Ill., assignor to Consolidated Packaging Corporation, Chicago, Ill.

Filed Oct. 1, 1973, Ser. No. 402,462

Int. Cl. B65d *5/48*

U.S. Cl. 229—28 R **8 Claims**



1. A folding plural-compartment carton having front and back side walls, two end walls, a bottom, and at least one partition parallel to said end walls, each said partition comprising a pair of overlapping and glued flaps cut out from said back and front walls spaced from said end walls to leave full height corners for said carton, all of said walls and partitions having at least a portion of their top edges the same maximum distance from said bottom wall.

3,889,868

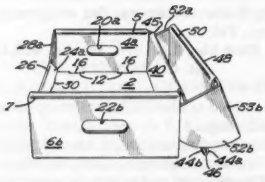
MAIL HANDLING CONTAINER

Arnold D. Bruckner, Bowie, Md., and Marlyn D. Johnson, Minneapolis, Minn., assignors to Liberty Carton Co., Minneapolis, Minn.

Filed Oct. 15, 1973, Ser. No. 406,692

Int. Cl. B65d *5/22*

U.S. Cl. 229—34 R **8 Claims**



1. A mail handling container formed from cut and scored bendable material comprising:

a bottom wall;

a pair of opposed, upright, front and rear side walls extending upwardly from fold line connections with the opposite longitudinal edges of said bottom wall;

a pair of opposed, upright end walls extending upwardly from said bottom wall at substantially right angles to said side walls and cooperating therewith to form a substantially rectangular container the top of which is defined by the upper edges of said side and end walls, each of said end walls being comprised of a single panel scored along a fold line to provide two end panel sections, one of which is an upright panel section hingedly attached to one end of said bottom wall and the other of which is folded downwardly and inwardly over said one end panel section along said end panel fold line to thereby form end walls of double wall thickness with said end panel sections defining an open ended pocket therebetween, and with said fold line defining the upper edge of said end walls;

a cover panel hingedly attached along one longitudinal edge thereof to the top edge of said rear side wall and disposed in a downwardly and forwardly folded closed position over said container top, said cover panel comprising a plurality of foldable sections interconnected with each other along fold lines extending parallel to said longitudinal hinged edge of said cover panel, said cover panel sections being foldable into a collapsed, downwardly and rearwardly extending condition in overlying relation to said rear side wall, whereby said cover panel may be opened, folded to said collapsed condition and secured in said collapsed condition by inserting said lock flaps into the rear end of said end wall pockets;

a pair of lock flaps hingedly attached to the opposite ends of said cover panel at the opposite, longitudinal free edge thereof and tucked into the front end of said end wall pockets to hold said cover panel in said closed position.

3,889,869

CARRIER-BAG

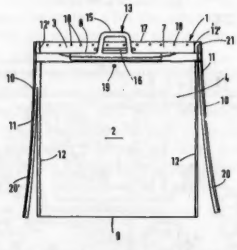
Heinrich Oggesen, Lauf and der Pegnitz, Germany, assignor to Messrs. Lakufal Kunstsloffs GmbH & Co., Lauf and der Pegnitz, Germany

Filed Jan. 11, 1974, Ser. No. 432,505

Claims priority, application Germany, Jan. 23, 1973, 2303106

Int. Cl. B65d *33/06*

U.S. Cl. 229—54 R **10 Claims**



1. A carrier bag comprising, in combination:

a. first and second web portions forming a first double wall of the bag;

b. third and fourth web portions forming a second double wall of the bag, the first and third web portions and the second and fourth web portions, respectively, being connected by a fold at the bottom of the bag, with the second and fourth web portions forming the inner walls of the two double walls, the upper edges of the first and second walls defining an opening into the interior of the carrier bag;

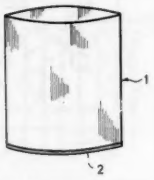
c. a first seam along each side edge of the bag each seam connecting at least the second and fourth web portions to one another; and

d. two second seams along each side edge of the bag, substantially parallel to and spaced inwardly from the first seam, connecting only the two web portions of each wall of the bag.

3,889,870
WELDED POLYESTER BAGS

Hugo Bender, Gerolzhofen, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed Dec. 5, 1972, Ser. No. 312,271
Claims priority, application Germany, Dec. 7, 1971, 2160497
Int. Cl. B65d 33/02
U.S. Cl. 229—55 2 Claims

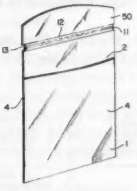


1. A welded bag of stretched polyester film, comprising a biaxially stretched tubular film with a bottom weld, in which the edge region of the bottom weld is post-stretched.

3,889,871
RECLOSEABLE FLEXIBLE BAG

David B. White, Willowdale, Canada, assignor to E. S. & A. Robinson (Canada) Ltd., Toronto, Canada

Continuation-in-part of Ser. No. 288,434, Sept. 12, 1972, Pat. No. 3,859,895. This application Feb. 26, 1973, Ser. No. 335,796
Claims priority, application Canada, Sept. 7, 1972, 151154
Int. Cl. B65d 33/30
U.S. Cl. 229—65 15 Claims

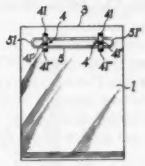


1. In a recloseable bag formed of flexible sheet material comprising at least a front wall and a rear wall at least one edge of each of said front and rear walls being sealed together, and said bag including in the surface of at least one wall thereof at least one elongate deformable member extending in a direction transverse to the common direction of said edges which are sealed together, wherein the improvement comprises that an end of said elongate member stops short of a line formed by extending the common direction of said edges which are sealed together, and none of said flexible sheet material lies in an area between said end of said deformable member and said line, said area being located between the ends of said edges which are sealed together, and said deformable member does not extend into said area.

3,889,872
PLASTIC BAG HAVING TIGHTENING BAND

Spencer B. T. Lin, 3F, No. 5, Ln. 4, Chin Chou St., Taipei, Taiwan, China

Filed Aug. 14, 1973, Ser. No. 388,190
Int. Cl.² B65D 33/28
U.S. Cl. 229—63 1 Claim

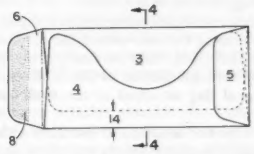


1. A plastic bag comprising a bag body, at least one retention member formed on said body at a predetermined distance from a bag opening, said retention member comprising a patch of plastic sheet or film having a length less than the entire circumference of said bag body and being hot sealed at least at three points on said bag body to define at least two passages in each retention member, and an endless band movably retained in the said passages.

3,889,873
MONEY MACHINE ENVELOPE

Gary Lee Clough, Kirkland, Wash., assignor to Champion International Corporation, Hamilton, Ohio

Filed Jan. 26, 1973, Ser. No. 327,033
Int. Cl. B65d 27/08
U.S. Cl. 229—72 2 Claims



1. A money machine envelope made from a single blank that comprises

a central panel of substantially rectangular shape,

an inner side panel of slightly trapezoidal shape attached to one side of said center panel and having an area at least half as great as the area encompassed by said center panel,

an outer side panel attached to the opposite side of said center panel the free edge of which has a very deep throat cutout of cosinusoidal shape in excess of one-half the center panel width,

and top and bottom flaps respectively attached to the top and bottom edges of said central panel, having adhesive areas thereon,

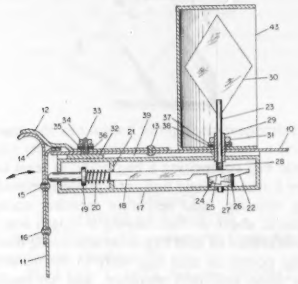
said inner side flap being folded to overlie said central panel, said outer panel being folded to overlie said inner panel and being at all times free of attachment to said inner panel whereby the inner panel is disposed between said outer and central panels and defines a divider wall between said outer and central panels, and

at least one of said top and bottom flaps being folded over and adhered only to said outer panel,

whereby a wallet type envelope is provided having inner and outer compartments in which the inner compartment can be end loaded and the outer compartment end or side loaded independently of the inner compartment, even

where the other of said end flaps is adhered to said outer panel.

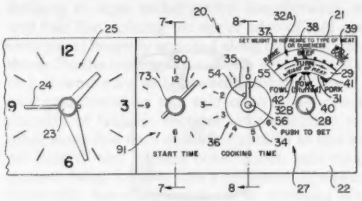
3,889,874
MAILBOX SIGNAL APPARATUS
Troy W. Arwood, Route No. 2, Lenoir City, Tenn. 37771
Filed Mar. 22, 1974, Ser. No. 453,944
Int. Cl.[2] A47G 29/12
U.S. Cl. 232—35 **5 Claims**



1. A signaling device of unitary construction for simple installation to indicate when a door of a front-opening mailbox has been opened, which comprises:
- an elongated frame to be mounted within the top of the mailbox with the long dimension thereof oriented perpendicular to the mailbox door, the frame being provided with an open top channel along its length;
- a non-rotatable rod mounted within the frame and axially movable therein, one end of the rod engaging the mailbox door during closure of the door;
- a coiled spring connected between the rod and the frame for normally biasing the rod toward the mailbox door;
- a rotatable shaft extending vertically from the frame for projection through the top of the mailbox;
- a visible signal flag attached to the shaft exterior to the mailbox;
- a rotatable member attached to the shaft within the frame, the rotatable member having radially-extending projections thereon;
- a notched surface on the rod normally engaged with a portion of the projections on the rotatable member whereby the rotatable member and shaft are rotated by axial movement of the rod in one direction and thereby the signal flag is moved from a first position to a second position;
- an upstanding threaded mounting stud adjustable along the top channel in the frame; and
- an externally threaded sleeve bushing engaged with the frame and surrounding a portion of the shaft between the frame and the signal flag.

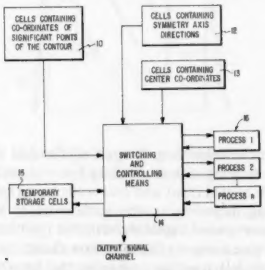
3,889,875
COOKING COMPUTER MEANS
Carl J. Goodhouse, Litchfield, Conn., assignor to Robertshaw Controls Company, Richmond, Va.
Division of Ser. No. 236,753, March 21, 1972, Pat. No. 3,837,568. This application Apr. 17, 1974, Ser. No. 461,532
Int. Cl. G01c 1/00
U.S. Cl. 235—61 A **10 Claims**

1. A cooking apparatus having a source of energy and an oven provided with heating means for heating the same when said heating means is operated by being operatively interconnected to said source of energy, said apparatus having a computer-controller device provided with controlling means for operatively interconnecting said source of energy to said heating means to operate the same for a period of cooking time as computed by said computer whereby said computer-controller device determines and controls the cooking operation of said cooking apparatus, said device having a stationary input means indicating selectable variables other than the weight of a meat item, said device having a manually settable weight input means for indicating a single selected indicated weight applicable to all meat items and corresponding to the weight of a particular meat item to be cooked, said weight input means being settable in relation to a selected variable of said stationary input means, said device having a time period output means operatively associated with both of said input means and said controlling means to provide as an output said cooking time period for said particular meat item computed as a function from the selection of both of said input means



whereby said controlling means is adapted to operate said heating means for said computed cooking time period, said device having operating means for operating said time period output means and said controlling means for said computed cooking time period when said operating means is activated, both of said input means, when utilized for the computing of said cooking time period for said particular meat item, continuously indicate the selected weight and variable for said particular meat item even after the operation of said time period output means for said computed cooking time period until said input means are utilized for causing the computation of a cooking time period for another meat item where the weight and selected variable are to be different from said particular meat item.

3,889,876
APPARATUS AND METHOD FOR AUTOMATIC SPLITTING OF DIE CAVITIES
Daniel G. McFadden, Parsippany, and Richard C. Levine, Plainfield, both of N.J., assignors to DieComp, Inc., South Plainfield, N.J.
Filed Sept. 29, 1972, Ser. No. 293,314
Int. Cl. B22d 45/00; G06g 7/48; G06f 15/20
U.S. Cl. 235—151.1 **34 Claims**



1. Apparatus for automatically splitting a die cavity, said apparatus comprising

means for storing contour characteristic signals representative of significant characteristics of the contour of the die cavity; and

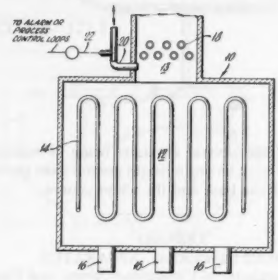
means responsive to said storing means for processing the stored signals to determine the split lines for dividing said cavity into segments which can be expeditiously machined.

3,889,877

FURNACE OVER-PRESSURE PREVENTION

John A. Kivlen, Denville, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed July 16, 1973, Ser. No. 379,452
Int. Cl. F23n 5/24
U.S. Cl. 236—15 C 3 Claims



1. A furnace having radiant and convection sections and at a location directly below said convection section normally operating at negative pressure relative to ambient barometric pressure, including an apparatus for preventing overpressuring of said furnace when said negative pressure exceeds said ambient barometric pressure comprising:

a. an open passageway located externally of said furnace connecting the interior of said furnace adjacent and below the convection section with the surrounding atmosphere, said passageway being constructed and arranged to permit continuous substantially unobstructed flow therethrough and of uniform size such that during normal operation ambient air normally flows inwardly to said furnace in sufficiently small quantities so that normal furnace operation is undisturbed and when said furnace is at positive pressure the normal inward flow of ambient air is reversed so that combustion gases flow outward through said passageway;

b. flow reversal detecting means operably connected with said passageway for detecting the reversal of flow in said passageway, said detecting means comprising a temperature sensing means for detecting changes in temperature in said passageway including indicating a low temperature when said ambient air flows into said furnace and a high temperature when said combustion gases flow out of said furnace; and

c. alarm means operably connected to said flow reversal detecting means and responsive to a detected change in flow direction in said passageway for providing an alarm signal when said detecting means indicates a high temperature resulting from combustion gases passing outward through said passageway.

3,889,878

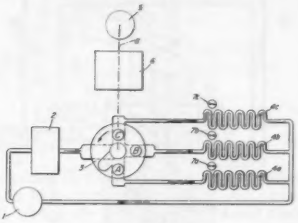
MULTI-WAY VALVE AND POSITION CONTROLLER THEREFOR

John Richard Evans, London, England, assignor to Allen West and Company, Limited, Brighton, England

Filed Feb. 16, 1973, Ser. No. 332,821
Int. Cl. F24d 3/02
U.S. Cl. 237—8 R 16 Claims

1. In a circulating hot fluid heating system comprising duct means defining a circuit including at least two sub-circuits in parallel with one another, a motor-driven, multi-way valve for controlling the flow of the hot fluid in said sub-circuits, said valve having a body and a movable valve member movable relative to said body and said valve defining a plurality of ways therethrough and having positions for each way and for at least one combination of said ways, motor means for driving said valve, heating means for heating said fluid, and means remote from the heating means for extracting heat from said fluid, a position controller comprising:

sensors corresponding to positions of respective said ways through said valve, each said sensor having an open state (corresponding valve way open) and a closed state (corresponding valve way closed) and also first (corresponding valve way to be opened) and second (corresponding valve way to be closed) conditions and comprising selector switch means for switching the sensor from the open



to the closed state and from the closed to the open state, control switch means for switching the sensor from the first to the second condition and from the second to the first condition, and circuit connector means interconnecting said selector switch means, said control switch means and said motor whereby said motor is energised by said sensor when said sensor is in its first condition and closed state and when said sensor is in its second condition and open state, and said motor is not energised by said sensor when said sensor is in its first condition and open state and when said sensor is in its second condition and closed state,

and at least one selector member for moving in a fixed relationship with said movable valve member, for actuating said selector switch means to change said sensors from respective open to closed states and closed to open states.

3,889,879

INTERNAL COMBUSTION ENGINE LIQUID COOLING SYSTEM

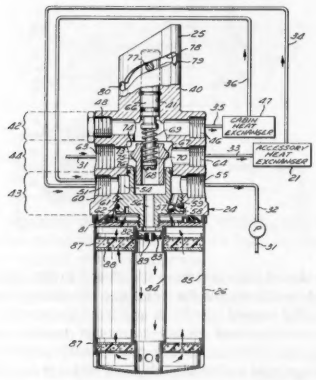
Ellis M. Wellman, Chardon, and Luis Moreiras, Northfield, both of Ohio, assignors to The Weatherhead Company, Cleveland, Ohio

Filed May 13, 1974, Ser. No. 469,250
Int. Cl. B60h 1/06
U.S. Cl. 237—12.3 B 20 Claims

1. A motor vehicle liquid cooling system comprising a pump having an inlet and an outlet, a radiator, a cabin heat exchanger having an inlet and an outlet, a liquid conditioner having an inlet and an outlet, and a flow control valve, said flow control valve being a multiple port valve having a cabin supply port hydraulically connected to said cabin heat exchanger inlet and a liquid conditioner supply port hydraulically connected to said liquid conditioner inlet, said flow control valve being movable to a summer position and to a winter position and to a service position, said flow control valve including valve means establishing fluid pressure communication between said pump outlet and said cabin heat exchanger inlet and establishing fluid pressure communication between said pump outlet and said liquid conditioner inlet when said flow control valve is in said winter position, said valve means closing fluid pressure communication between

said pump outlet and said cabin heat exchanger inlet and establishing fluid pressure communication between said pump outlet and said liquid conditioner inlet when said flow control valve is in said summer position, and said valve means closing fluid pressure communication between said pump outlet and said liquid conditioner inlet when said flow control valve is in said service position.

18. An internal combustion engine liquid cooling system comprising a pump having an inlet and an outlet, a radiator, a heat exchanger having an inlet and an outlet, a liquid conditioner having an inlet and an outlet, and a flow control valve, said flow control valve and liquid conditioner being combined in a single integral unit, said flow control valve being a multiple port valve having a heat exchanger supply port hydraulically connected to said heat exchanger inlet and a liquid



conditioner supply port hydraulically connected to said liquid conditioner inlet, said flow control valve being movable to a first position and to a second position and to a service position, said flow control valve including valve means establishing fluid pressure communication between said pump outlet and said heat exchanger inlet and establishing fluid pressure communication between said pump outlet and said liquid conditioner inlet when said flow control valve is in said second position, said valve means closing fluid pressure communication between said pump outlet and said heat exchanger inlet and establishing fluid pressure communication between said pump outlet and said liquid conditioner inlet when said flow control valve is in said first position, and said valve means closing fluid pressure communication between said pump outlet and said liquid conditioner inlet when said flow control valve is in said service position.

3,889,880

FLOATING FOUNTAIN

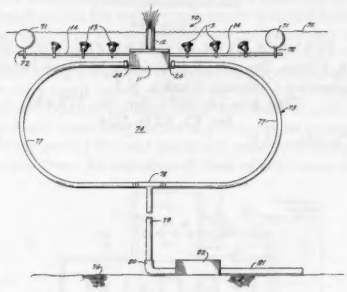
John O. Hruby, Jr., Burbank, Calif., assignor to Rain Jet Corporation, Burbank, Calif.

Division of Ser. No. 304,244, Nov. 6, 1972, Pat. No. 3,814,317, which is a continuation-in-part of Ser. No. 87,886, Nov. 9, 1970, Pat. No. 3,705,686. This application Dec. 5, 1973, Ser. No. 421,802

Int. Cl. B05b *17/08*

U.S. Cl. 239—18 **6 Claims**

1. A floating fountain assembly comprising a mounting base defining a chamber therein and a plurality of inlet openings to the chamber formed through side walls of the chamber at regularly spaced intervals around the base, a water discharge nozzle mounted to the base for receiving water from the chamber, float means coupled to the base for buoyantly supporting the base and nozzle in a body of water with at least a part of the nozzle disposed above the water surface, a flexible water supply conduit connected to each chamber inlet opening at one end thereof and extending to a fountain water source common to the other conduits and disposed at a submerged location in the body of water substantially directly



below the base, the several conduits being of substantially equal length and each having a length greater than the vertical distance between the base and the water source.

3,889,881

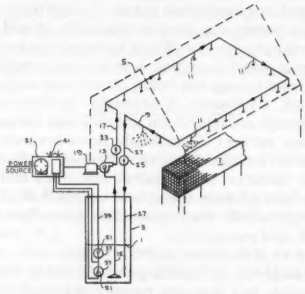
LIQUID DISPERSAL APPARATUS

Lonnie C. Cunningham, 26 Champions Colony, and Thomas P. Travis, 4625 Stillbrooke, both of Houston, Tex. 77000

Filed May 29, 1974, Ser. No. 474,246

Int. Cl. A01g *27/00*; **B05b** *1/30*

U.S. Cl. 239—70 **13 Claims**



1. In an insecticide distribution apparatus for automatically dispersing insecticide fluid periodically in an atomized state over a predetermined area of display substantially instantaneously upon the actuation thereof:

a conduit line for carrying the insecticide fluid,

nozzle means affixed in fluid communicating relation to said line for atomizing and dispersing the fluid that flows periodically therethrough into the surrounding atmosphere,

first fluid pressure means communicating with said line for maintaining a positive fluid pressure therein during the intervals when said nozzle means are not periodically dispersing the fluid,

second fluid pressure means communicating with said nozzle means for emitting fluid through said nozzle means only when the line pressure is above a predetermined level, such predetermined level being higher than the positive pressure maintained by said first fluid pressure means, and

intermittently actuated pumping means for supplying insecticide fluid to said conduit line, said pumping means and first and second fluid pressure means cooperating to

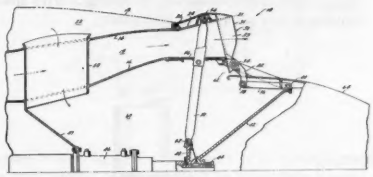
produce an instantaneous atomized fluid dispersion at regular periods from said nozzle means and without any fluid or pressure loss in said line during the intervals therebetween when the line pressure is maintained by said first fluid pressure means.

3,889,882

RETRACTABLE SOUND SUPPRESSOR FOR A GAS TURBINE ENGINE

Thomas Neil Hull, Jr.; James Leroy Nye, both of Marblehead, and William Steyer, Ipswich, all of Mass., assignors to General Electric Company, Lynn, Mass.

Filed Mar. 25, 1974, Ser. No. 454,750
Int. Cl. B64d *33/04*
U.S. Cl. 239—127.3 **6 Claims**



1. A retractable sound suppressor for the exhaust duct of a gas turbine engine comprising:

a plurality of circumferentially spaced variable nozzle flaps disposed for rotation about the aft end of the exhaust duct to provide a variable area nozzle;

a plurality of circumferentially spaced apart divider chutes disposed for rotation about the aft end of the exhaust duct, each chute of which may be rotated between an inoperative position clear of the exhaust duct and an operative position wherein the chute radiates transversely of the duct;

single actuator means centrally disposed in the gas turbine engine for synchronously rotating the variable nozzle flaps and divider chutes such that the outer radial tips of the divider chutes engage respective nozzle flaps when the divider chutes are in the operative position to thereby substantially maintain the same effective nozzle area for the suppressed and non-suppressed modes of operation.

3,889,883

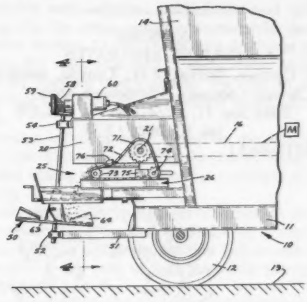
LIVE BOTTOM CHUTE FOR SPREADERS

Robert D. Anderson, Murdock, Minn., assignor to TCI, Inc., Benson, Minn.

Filed Jan. 7, 1974, Ser. No. 431,390
Int. Cl. A01c *17/00*
U.S. Cl. 239—679 **14 Claims**

1. In a spreader for particulate material having a storage compartment, and means for discharging material from said storage compartment, a spreader mechanism for receiving and spreading said particulate material the spreading pattern of which is dependent on the location where material to be spread is deposited thereon, said means for discharging depositing said material in a location above said spreading mechanism, the improvement comprising a movable conveyor belt assembly positioned below said means for discharging material in position to receive material therefrom and to convey said material to said spreader mechanism, said conveyor belt having a discharge end for depositing material on said spreader mechanism, and means movably mounting said conveyor belt assembly on said spreader whereby the discharge end of said conveyor belt can be adjusted with respect to said spreader mechanism to change the location where material carried by the conveyor belt assembly is deposited on said spreader mechanism.

12. In a spreader for particulate material having a storage compartment, means for delivering the particulate material from said storage compartment, and spinner means positioned to receive material from said storage compartment and for spreading the material, said spinner means including a first member rotating in a plane about a generally upright axis, and blade means mounted on said first member, said blade means



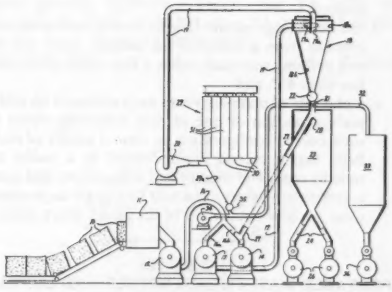
including a planar member extending upwardly from said first member and having upper portions of said planar member rotationally trailing the lower portions of said blade member adjacent said first member, and an upper flange on said blade member, said flange rotationally leading said blade member, and extending from an inner end near said generally upright axis outwardly away from said axis and upwardly in direction away from said first member.

3,889,884

HAY PRODUCT AND METHOD FOR FORMING

George W. Morse, 9444 S. Wales Way, Elk Grove, Calif. 95624

Filed Feb. 9, 1973, Ser. No. 331,207
Int. Cl. B02c *19/00*
U.S. Cl. 241—24 **4 Claims**



1. A method for preparing a readily pelletizable pellet from a pulverized finely divided hay powder formed of a leafy fiber containing legume and including stem particles, leaf vein particles, and deveined leaf blade particles, comprising the steps of continuously supplying said hay powder under pneumatic pressure tangentially to a centrifugal separation chamber whereby said powder is caused to rotate abouts its axis with application of centrifugal separating forces, continuously removing an overflow from a region adjacent said axis and collecting said overflow as a first product, separating the overflow solid particles and gas, continuously removing an underflow from one end of the chamber and collecting said underflow as a second product, said underflow containing

centrifugal separated particles which are heavier and larger than said overflow particles, continuously recycling at least 10 percent by weight of said underflow particles to mix with said supply of hay powder, whereby the average weight of said overflow particles is substantially increased in comparison to said overflow particles without recycling underflow particles and at least 20 percent of said overflow particles being of a size large enough for retention on a 150 standard mesh screen.

3,889,885

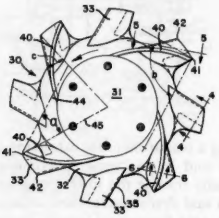
PULPING APPARATUS

J. Walter Couture, Dorval, P.Q., Canada, assignor to The Black Clawson Company, Middletown, Ohio

Filed Jan. 11, 1974, Ser. No. 432,576

Int. Cl. B02c *13/28*

U.S. Cl. 241—46.11 **6 Claims**



1. A rotor assembly for use in pulping apparatus of the character described for liquid slurry stock including a tub for receiving a quantity of stock and a bedplate mounted in the tub and having a working surface, comprising:

a. a rotor body adapted to be mounted for rotation in predetermined direction in cooperative relation with the bedplate and having a plurality of defibering vanes projecting outwardly therefrom in angularly spaced relation,

b. each of said vanes having under and upper surface portions of substantial area,

c. means forming an essentially straight leading face on each of said vanes connecting said upper and under surfaces thereof,

d. the outer edge of said face extending in said direction of rotation from a radius to the radially outer end thereof and defining with said radius a first angle of substantially less than 45°, and

e. a plurality of pumping vanes each mounted on said upper surface portion of one of said defibering vanes and of such curved configuration as viewed axially of said rotor body that a second angle defined by a radius to said radially outer end thereof and a tangent to said outer end is sufficiently larger than said first angle to promote efficient vortical circulation of the liquid slurry stock.

3,889,886

PORTABLE WASTE GLASS BOTTLE AND CONTAINER CRUSHING DEVICE

Jene D. Spivey, 7041 Aivlis St., Long Beach, Calif. 90815

Filed Oct. 10, 1973, Ser. No. 405,030

Int. Cl. B02c *19/12*

U.S. Cl. 241—100 **1 Claim**

1. A portable power driven glass container crushing device that may be removably mounted on a drum having an upper open end to fill said drum with crushed glass containers when said device is resting on the flat bed of a conventional truck or trailer or on the ground, said crushing device including:

a. a rigid, cylindrical vertically disposed shell that has upper and lower open ends, with said shell having a lower end portion of such transverse cross section as to be removably insertable through said open end of said drum and extend downwardly therein;

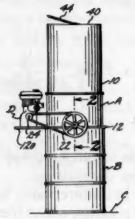
b. a circumferentially extending circular flange that projects outwardly from said shell adjacent said lower open end thereof, said flange acting as a stop by engaging an upper edge of said drum to support said shell therefrom, with said lower end portion of said shell extending downwardly into said drum;

c. a plurality of rigid, parallel, laterally spaced first bars that extend transversely across the interior of said drum and intermediately disposed between said upper and lower ends thereof;

d. diametrically opposed bearing means supported in fixed positions on said flange relative to said drum;

e. a shaft rotatably supported in said bearing means, said shaft having a first end portion that projects outwardly from said bearing means and said shaft adjacently disposed to said first bars;

f. an internal combustion engine assembly supported on said flange, said engine assembly including a drive shaft and a driving pulley secured to said shaft;



g. an endless belt;

h. a driven pulley rigidly secured to said first end of said shaft and drivingly engaged by said belt;

i. a plurality of second parallel transversely spaced bars that are rigidly secured to said shaft intermediate the ends of said bars, said second bars being rotatable through spaces defined between said first bars, and said second bars of such length as to project upwardly a substantial distance above said first bars when said second bars are substantially normal to said first bars; and

j. a plurality of vertically spaced baffles in the upper interior of said shell that angle downwardly and overlap, with a glass container when deposited in the upper open end of said shell dropping downwardly therein by gravity through spaces defined between said baffles to a position adjacent said first bars where said container is sequentially struck by said rotating second bars to be broken into a plurality of pieces sufficiently small as to fall downwardly through said spaces between said first bars into said drum.

3,889,887

APPARATUS TO CONTROL BOTH THE OPERATION OF A CUTTING REEL AND THE GRINDING MECHANISM OF A FORAGE HARVESTER

Robert A. Wagstaff, New Holland, Pa., and Poul K. Pedersen, Kerteminde, Denmark, assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Nov. 19, 1973, Ser. No. 417,461

Claims priority, application Canada, Oct. 5, 1973, 182762/73

Int. Cl.² A01D *75/08;* **B24B** *3/42*

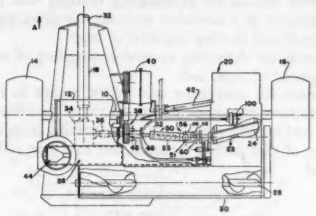
U.S. Cl. 241—101.2 **4 Claims**

1. An apparatus to control the operation of a cutting reel and the grinding mechanism for sharpening the cutting reel of a forage harvester which comprises:

a. a main power source,

b. a transmission member having one end fixed to the power source,

c. a coupling assembly comprising first means for receiving the other end of the transmission member,
d. driving means including a first rotatable shaft on which said cutting reel is mounted, a second rotatable shaft spaced a distance from said first shaft and means operably associated with said second shaft for driving said grinding mechanism,
e. said coupling assembly further comprising second means for receiving an end of either said first or second rotatable shafts, and means for securing said second receiving



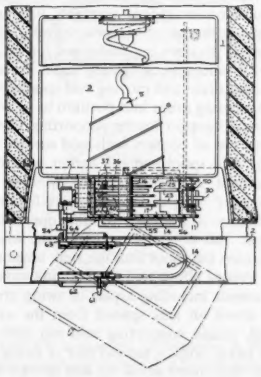
means to said first rotatable shaft or to various positions on said second rotatable shaft to selectively couple said transmission member to the cutting reel and the grinding mechanism in a first driving mode in which the cutting reel is driven in a forward direction while the grinding mechanism is disengaged from said power source, a second driving mode in which said cutting reel is driven in a rearward direction while simultaneously driving said grinding mechanism, and a third driving mode in which said grinding mechanism is driven while said cutting reel is disengaged from said power source.

3,889,888

COMBINATION ICE CUBE AND CRUSHED ICE DISPENSER

Luis E. Prada, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Division of Ser. No. 348,867, April 9, 1973, Pat. No. 3,843,067. This application June 17, 1974, Ser. No. 480,040
Int. Cl. B02c *13/06*
U.S. Cl. 241—101.1 **4 Claims**



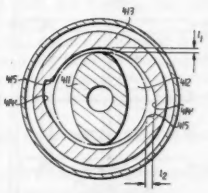
1. A combination ice cube and crushed ice dispenser comprising:
a housing having a generally vertical front wall, a rear wall, a pair of opposed side walls, a top wall and a bottom wall defining a crusher housing having an outlet at the bottom thereof;
a horizontally rotatable member carrying crusher blades in said crusher housing;
said housing including an ice inlet opening generally above and to one side of the axis of said rotatable member through which ice cubes are introduced into the rotational path of said crusher blades;
said crusher walls adjacent and opposite said opening confining the ice cubes passing downwardly through said crusher housing to said outlet to a discharge path intersecting the rotational path of said crusher blades;
means for rotating said rotatable member in a direction such that said arms move upwardly along said discharge path;
said crusher including anvil means on the opposite side of said axis from said opening for cooperating with said crusher blades to crush ice pieces conveyed to said anvil means;
said anvil means comprising a set of stationary arms spaced to provide coarse crushed ice and a set of movable arms movable to an operative position below said stationary arms and in the path of said blades for providing finely crushed ice; and
said crusher including a pivotally mounted member movable between a first position permitting said ice cubes to pass directly to said outlet and a second position in which the lower end thereof overlaps said stationary arms for intercepting the passage of said ice cubes downwardly through said passage whereby said ice cubes are picked up by said crusher arms and conveyed to said anvil means;
said movable arms engaging and supporting the lower end of said interceptor means when said movable arms are in their operative position.

3,889,889

APPARATUS FOR PULVERIZING VULCANIZED RUBBER AND RUBBER PRODUCTS

Kiyohiko Sawa, Kobe, Japan, assignor to Kobe Steel, Ltd., Kobe, Japan

Filed Apr. 2, 1973, Ser. No. 346,871
Claims priority, application Japan, Aug. 14, 1972, 47-81286; Aug. 14, 1972, 47-81287; Aug. 23, 1972, 47-84753
Int. Cl. B02c *13/02*
U.S. Cl. 241—228 **2 Claims**

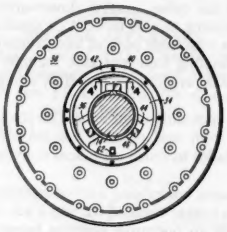


1. An apparatus for pulverizing rubber materials such as vulcanized rubber and rubber products, which comprises:
a rotor having an egg-shaped cross-section;
a casing surrounding said rotor;
drive means for rotating said rotor relative to said casing; and
clearance-changing means for changing the clearance formed between the outer periphery of said rotor and the inner wall of said casing as said rotor rotates, said clearance-changing means includes an inner wall of non-circular cross-section disposed within said casing.

3,889,890
REFINER DISC

Anton J. Horstman, Springfield, Ohio, assignor to The Bauer Bros. Co., Springfield, Ohio

Filed Jan. 21, 1974, Ser. No. 435,233
Int. Cl. B02c 7/06
U.S. Cl. 241—245 17 Claims

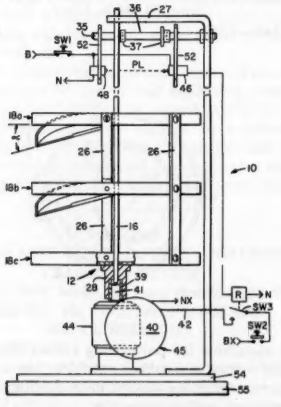


1. A feed end refining disc for use in a disc refiner comprising a plate-like body having an infeed face, an operating face, and at least one feed passage having an exit end at said operating face and an entrance end opening from said infeed face, characterized by means providing an irregular surface contour on said infeed face at least a portion of which is projected from said infeed face and arranged thereon adjacent and generally clear of said entrance end of said feed passage to inhibit material fed to said infeed face for movement through said feed passage from building up on said infeed face.

3,889,891
METHOD AND APPARATUS FOR TRANSFERRING TAPE FROM A PLURALITY OF ROLLS

Edward S. Walker, Danville, Ky., assignor to Corning Glass Works, Corning, N.Y.

Filed May 6, 1974, Ser. No. 467,452
Int. Cl. B65h 75/02
U.S. Cl. 242—55 8 Claims



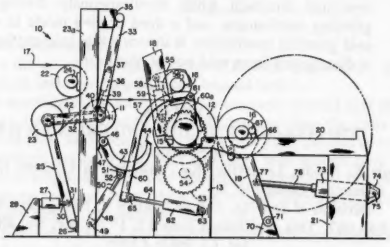
1. A device for transferring tape from a plurality of coreless rolls of tape including first and second rolls of tape, each of said rolls having innermost and outermost tape ends, with the outermost end of said first tape roll being connected to the innermost tape end of said second tape roll, thus forming a connecting tape segment, and with the innermost end of said first roll spiralling upwardly from the center of said first tape roll in response to pulling force exerted thereon, thus forming a feeding segment of tape, such device comprising

a. a plurality of vertically spaced apart horizontal platforms for coaxially supporting said plurality of coreless rolls of tape, including a first platform for supporting said first roll of tape coaxially above said second roll of tape, with said first platform having a feed slot to permit said connecting tape segment to feed therethrough upon the depletion of said first roll of tape;
b. guide means above said first tape roll for directing the transfer of said feeding segment of tape;
c. motor means for periodically rotating said plurality of platforms in a direction opposite the direction of spiralling of said feeding segment of tape;
d. means for detecting excessive spiralling of said feeding segment of tape; and
e. means for energizing said motor means in response to detection by said detection means of excessive spiralling of said feeding segment of tape resulting from the application of said pulling force on said first tape roll innermost end.

3,889,892
CENTER START SURFACE WIND REEL WITH AUTOMATIC CUT-OFF AND TRANSFER

James J. Melead, Roscoe, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed Aug. 9, 1973, Ser. No. 387,122
Int. Cl. B65h 19/20, 17/08
U.S. Cl. 242—56 R 14 Claims



1. In an apparatus for winding a web of sheet material and transferring the web from an initial center to surface winding during the winding operation, a spool for the web, a surface winding drum, power means rotatably driving said surface winding drum at the speed of linear travel of the web, a pair of primary arms for carrying said spool for rotation about an axis parallel to and spaced radially from the surface of said surface winding drum and moving said spool about the axis of said surface winding drum into position to be wound from the surface thereof, support means supporting said spool in said primary arms out of contact with said surface winding drum and bringing said spool and the center wound web thereon into engagement with said surface winding drum, power means rotatably driving said spool, means for severing the web at the termination of a surface winding operation, a nip defining enveloper roll cooperating with said winding drum to partially envelop the spool with the web, tensioning means for the web as trained about said nip defining enveloper roll, the tensioning means including a pair of swing arms pivoted for movement about an axis spaced from the axis of said nip defining roll, means supporting said nip defining enveloper roll on said swing arms, a second pair of swing arms pivotally mounted for movement about an axis spaced beneath and at the incoming side of said nip defining enveloper roll, a tension roller supported on said second swing arms adjacent the upper ends thereof, a link pivotally connecting the adjacent ends of said swing arms to swing together, an idler freely rotatable

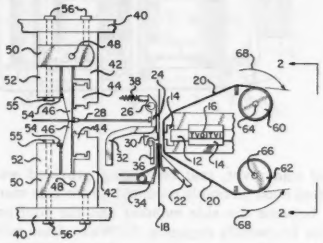
about a fixed axis spaced on the same side of the axis of said tension roll as the axis of pivotal movement of said first-mentioned swing arms, and fluid pressure means for moving said swing arms and tension roll relative to said idler.

3,889,893

RIBBON DRIVE AND CONTROL SYSTEM

Ira Silverman, Chatsworth, Calif., and James M. Irvine, Lake Orion, Mich., assignors to Computer Peripherals, Inc., Edina, Minn.

Filed Jan. 14, 1974, Ser. No. 432,819
Int. Cl. B65h *25/26, 17/02*
U.S. Cl. 242—57.1 **17 Claims**



1. Ribbon drive and control mechanism comprising a pair of reels for carrying said ribbon in a path past a station for printing operations, said ribbon having conductive elements thereon, a

drive motor connected to each of said reels for driving thereof, potentiometer means connected with each of said drive motors for providing a predetermined voltage thereto, each of said motors having different voltages applied thereto for providing driving of one reel in one direction while providing drag on the other reel and in the same direction, and

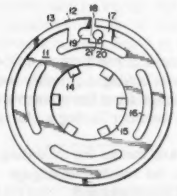
switching means including a pair of spaced members positioned adjacent each of said reels and contactable by said conductive elements on said ribbon near the ends thereof for actuating said switching means thereby reversing the direction of said drive motors to alternately provide for drive and for drag of the reels.

3,889,894

CASSETTE REEL HUB FOR A TAPE RECORDER

Michiyuki Deguchi, Tokyo, Japan, assignor to Ugen-Kaisha Overu Engineering, Tokyo, Japan

Filed Feb. 5, 1974, Ser. No. 439,767
Claims priority, application Japan, Feb. 7, 1973, 48-16356
Int. Cl. B65h *75/28*
U.S. Cl. 242—74 **7 Claims**



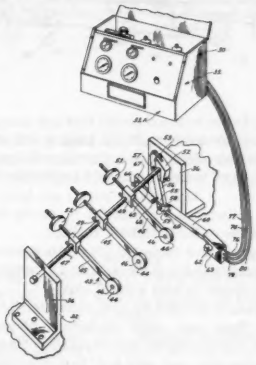
1. A reel hub for a cassette comprising a reel hub body having an outer periphery on which a tape is wound, an opening provided adjacent to the outer periphery and having an inner surface, a slit provided in the outer periphery of the reel hub body to communicate with the opening and adapted to permit the tape to be inserted therethrough, and a recess communicating with the opening; and engaging member provided in the opening, and a connecting member for connecting the engaging member to the inner surface of the opening, the connecting member being fractured to fit the engaging member into the recess thereby to fixedly secure the end of the tape between the inner surface of the recess and the engaging member.

3,889,895

WEB-TENSION SENSING AND CONTROL APPARATUS

Ferenc Edes, Bolingbrook, and Henry L. Gianatasio, River Forest, both of Ill., assignors to Air-Trol Systems, Inc., Addison, Ill.

Filed Dec. 26, 1973, Ser. No. 428,367
Int. Cl. B65h *23/08*
U.S. Cl. 242—75.43 **5 Claims**



1. A web tension sensing and control apparatus for sensing and controlling the tension of a web of paper, plastic resinous film, or the like, fed from a roll thereof carried by a roll-supporting shaft, comprising:

a. supporting means;

b. web-tension sensing means movably mounted on the said supporting means and adapted to bear upon the said web above the latter;

c. pneumatically operated braking means on the said roll-supporting shaft for braking the action of said roll-supporting shaft;

d. air supply means for supplying air under pressure to the said pneumatically operated braking means;

e. first air valve control means for controlling the flow of air to said pneumatically operated braking means to actuate the latter;

f. power means for operating the said first air valve control means;

g. pneumatically controlled power transmission means for operating the said power means;

h. pneumatic control means under the control of the said web-tension sensing means for controlling the operation of the said pneumatically controlled power transmission means and including

1 a pneumatic sensing head having therein (a) a throat portion;

2 a sensing member operable by and responsive to movement of the said web-tension-sensing means and having a portion movable into and out of the said throat portion of the said pneumatic sensing head; and

3 second air valve control means under the control of the said pneumatic sensing head and the said throat portion thereof and the said portion of the said sensing member

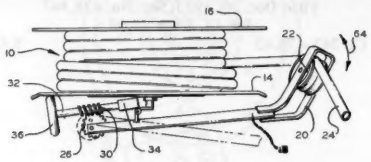
and responsive to the position of the said portion of the said sensing member in and relative to the said throat portion of the said pneumatic sensing head for controlling the operation of the said pneumatically controlled power transmission means.

3,889,896

HOSE COILING APPARATUS

Arthur C. O'Hara, 4978 Skyline Dr., Syracuse, N.Y. 13215

Filed Mar. 21, 1974, Ser. No. 453,380
Int. Cl. B65h *75/38*
U.S. Cl. 242—86 **10 Claims**



1. Apparatus for assisting in the coiling and uncoiling of an elongated, flexible element in a plurality of layers of side-by-side revolutions of the element, said apparatus comprising, in combination:

a. a fixed cylindrical element for receiving the coiled element on the outer periphery thereof;

b. an elongated arm mounted for rotation about the central axis of said cylindrical element and arranged with its own axis transverse to said central axis;

c. pulley means carried by said elongated arm and spaced radially from said outer periphery of said cylindrical element, and having an axis of rotation transverse to both said central axis and said arm axis, whereby the flexible element may extend tangentially from the coil, over said pulley means and substantially parallel to said central axis;

d. spring means constructed and arranged to be tensioned by rotation of said arm in a first direction to exert a biasing force tending to rotate said arm in the opposite direction;

e. mounting means allowing reciprocating traversing movement of said pulley means between positions radially spaced from each end of said cylindrical element; and

f. motion transfer means for imparting a predetermined increment of said traversing movement to said pulley means in response to each revolution of said arm in either direction about said central axis.

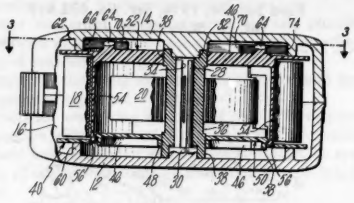
3,889,897

COILABLE TAPE MEASURING DEVICE HAVING A SELF-REGULATING SPEED CONTROL MECHANISM

Henderik Van Zelderen, St. Avon, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Sept. 26, 1973, Ser. No. 401,044
Int. Cl. B65h *75/48*
U.S. Cl. 242—107.3 **4 Claims**

1. A tape measuring device adapted for self-regulating the recoil speed thereof comprising a casing including spaced apart side walls defining a chamber, a reel rotatably journaled within the chamber, a coiled measuring tape counted on the reel for rotation in a first rotatable direction as the tape is withdrawn from the casing and a power drive spring mounted within the chamber for driving the measuring tape in a reverse direction from said first rotatable direction into a recoiled position within the chamber, said reel including a pair of spaced apart side members in close confronting relationship with the casing side walls, said side members having an outer peripheral rim, one of said side members carrying a pivot adjacent but spaced from the peripheral rim, the casing wall confronting said pivot having an annular shoulder extending toward said reel intermediate the peripheral rim and the pivot, said annular shoulder engaging the confronting side member of the reel to alignably confine said reel within the chamber and limit transverse movement of said reel, said shoulder including an arcuate brake drum surface generally facing



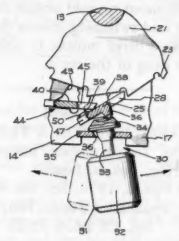
toward said pivot, said reel being provided with a planar weighted mass pivotably mounted on the side member at said pivot between the side member and the confronting casing wall for frictionally engaging the brake drum surface of said shoulder and bearing thereagainst in proportion to the centrifugal force applied to the reel by the power drive spring when driving the measuring tape into its recoiled position.

3,889,898

PIGGYBACK DUAL LOCK BAR

Avraham Ziv, Sepulveda, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.

Filed Apr. 10, 1974, Ser. No. 459,539
Int. Cl. A62b *35/02*
U.S. Cl. 242—107.4 **7 Claims**



1. A fail safe locking mechanism for emergency locking safety belt retractors having a primary locking pawl for preventing belt protraction from the retractor by engaging a tooth of a ratchet wheel member having a plurality of ratchet teeth and comprising:

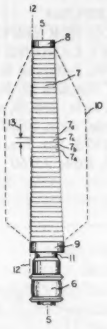
a fail safe pawl and means for mounting it to said retractor in position to be moved to engage with teeth of said ratchet wheel member; and

means for moveably mounting said primary locking pawl to provide for its movement against said fail safe pawl to move the latter into engagement with a ratchet tooth of said ratchet member upon a deflective movement of said primary locking pawl relative to said ratchet member, as when said locking pawl engages a tip of a ratchet tooth and is deflected away from said ratchet member.

3,889,899
INCREMENTALLY-TAPERED BOBBINS

Samuel F. Adams, Greenville, S.C., and Robert J. Guerin, Providence, R.I., assignors to American Paper Tube Company, Woonsocket, R.I.

Filed Oct. 1, 1973, Ser. No. 402,148
Int. Cl. B65h 75/10
U.S. Cl. 242—118.32 1 Claim



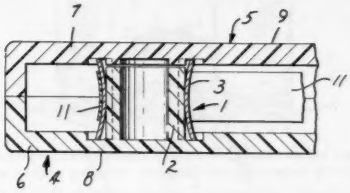
1. A bobbin for textile yarns and the like having an elongated body portion of substantially circular cross-sectional outline for collection and holding of a yarn package thereon, said body portion being of resin-impregnated paper and about ten inches in length and having an outer diameter of about one and one-eighth inches near said bottom, the exterior of said body portion being of incrementally-stepped configuration longitudinally thereof and involving a plurality of relatively short-length steps in end-to-end relationship along all of said body portion upon which yarns are intended to be wound, said body portion being tubular and following an inward taper in direction from bottom to top of said bobbin, said linear taper from bottom to top being about 0.025 inch per inch, the generatrix of each of said step surfaces being slightly sloped in relation to the longitudinal profile of said bobbin and said step surfaces being sloped in direction opposite to the direction of said taper, and the riser surfaces interconnecting adjoining ones of said step surfaces being relatively short and sloped in greater than acute-angle relationships to said step surfaces, the slope of said step surfaces being not in excess of a few degrees, the length of each of said step surfaces being substantially one-fourth inch, all the outer ends of said step surfaces being disposed along paths defining linear toward taper of said body portion from bottom to top thereof, and said riser surfaces being smoothly contoured in interconnecting said step surfaces, all of the surfaces of said body portion being substantially smooth and uninterrupted except for said stepped configuration, and the maximum height of said riser surfaces, in direction radially, of said bobbin, being of the order of a few thousandths of an inch, whereby yarn entrapments on said bobbin exterior are avoided, controlled even winding of yarn is promoted, and waste removal is facilitated by said stepped configuration.

3,889,900
CARTRIDGE TAPE GUIDE

Norman E. Nelson, Roseville, Minn., assignor to Alexander, Sell, Steldt & DeLaHunt, St. Paul, Minn.

Filed Aug. 1, 1973, Ser. No. 384,596
Int. Cl. G11b 23/10
U.S. Cl. 242—199 6 Claims

1. In a tape cartridge the combination comprising:
a case with spaced apart sidewalls;
at least one fixed mounting post protruding from an inner surface of one of said sidewalls and disposed near one peripheral edge of said case;
a sleeve formed from a low friction material and affixed on said post, said sleeve having a concave sidewall that exerts centering forces on tape that is guided by said sleeve; and

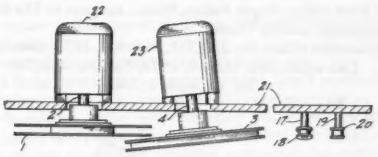


one of said post and said sleeve is out of round and the other is cylindrically shaped, and said sleeve is of such size that it is deformed from its normal shape to fit on said post with a friction fit and have a spring retention effect to securely hold the sleeve on the post.

3,889,901
COMPACT MAGNETIC TAPE DRIVE WITH OVERLAPPING TAPE REELS LYING IN DIFFERENT PLANES

Sigurd Hoyer, Glen Head, N.Y., assignor to Potter Instrument Co., Inc., Plainview, N.Y.

Filed May 8, 1974, Ser. No. 468,192
Int. Cl. G11b 15/28, 15/58
U.S. Cl. 242—209 7 Claims



1. In a magnetic tape handler, the combination of;
a servo motor driven magnetic tape first reel mounted on a plate with its axis perpendicular to said plate;
a servo motor driven magnetic tape second reel mounted on said plate with its axis disposed with respect to the axis of said first reel at a distance therefrom of between 25 and 50 percent less than the diameter of said reels and tilted with respect to said first reel whereby said second reel substantially overlaps said first reel;
a motor driven capstan and read/write head mounted along the tape path between said two reels and oriented in accordance with the position of said first reel;
and two idler pulleys mounted adjacent to said second reel, one oriented in accordance with said second reel and the other oriented in accordance with said first reel for redirecting the tape as it is passed from one of said reels to the other.

3,889,902

HELICOPTER COMPRISING A PLURALITY OF LIFTING ROTORS AND AT LEAST ONE PROPELLING UNIT

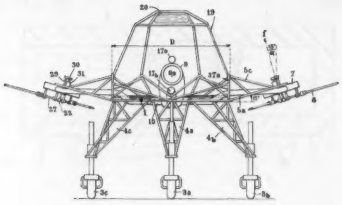
Francois Madet, 44 rue Guillaume du vair, 94290-Villeneuve le Roi, France

Filed Dec. 26, 1973, Ser. No. 427,632

Claims priority, application France, Dec. 26, 1972, 72.46176

Int. Cl. B64c *27/08*

U.S. Cl. 244—17.23 **9 Claims**



1. A multi-rotor helicopter comprising a platform of polygonal configuration having $2n$ sides and at least one median axis, a propelling jet-engine for horizontal flight, disposed along said platform median axis, a number n of pairs of short-bladed lift rotors having a diameter smaller than that of said platform, the two rotors of each pair rotating in opposite directions and being disposed symmetrically in relation to the axis of said platform along the periphery thereof, with a relative angular shift of $180°/n$, the axes of each pair of rotors converging to a point located above the median axis of said platform and the centre thereof, n pairs of gas turbines mounted adjacent the periphery of said platform, and having corresponding rotors coupled coaxially to said $2n$ lift rotors, means for producing propelling gases and means for distributing in a controlled manner said propelling gases to said turbines.

3,889,903

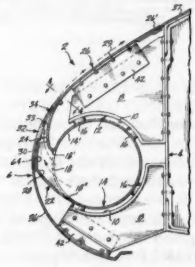
AIRFOIL LEADING EDGE STRUCTURE WITH BOUNDARY LAYER CONTROL

Noel Evan Hilby, Maple Valley, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 339,735, March 9, 1973, abandoned. This application Mar. 4, 1974, Ser. No. 448,080

Int. Cl. B64c *21/04*

U.S. Cl. 244—42 CC **10 Claims**



1. In the leading edge structure of an airfoil, a spar spanwise thereof, front opening jaws on the spar, a boundary layer control duct supported in the jaws, and having a longitudinally extending slot along the forward side thereof, which slot has coextensive, relatively upper and lower lips projecting outboard from the upper and lower edges thereof, the upper of which lips extends reentrantly upwardly and distantly away from the upper edge of the slot, and forms the overside of the leading edge of the airfoil, and the lower of which lips forms a throat with the upper lip, outboard of the slot, and has a deflector thereon which forms a convergent nozzle with the upper lip, through which the throat discharges upwardly over the outer surface of the upper lip, said duct being part cylindrical in cross section, and mounted in jaws of complementary cross section, with symmetrically radially oriented spacers interposed therebetween.

3,889,904

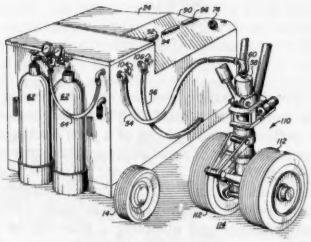
MEANS AND METHOD FOR SERVICING FLUID CUSHIONED AIRCRAFT LANDING GEAR STRUTS

Chester L. M. Jones, 2610 W. Jefferson St.; Raymond J. Yoakam, 4618 N. 71st Ave.; Mitchell M. Hazar, 3120 N. Rose Circle Dr., all of Phoenix, Ariz. 85026, and Alfred J. Dillon, 4800 W. Ocotillo, Glendale, Ariz. 85301

Filed June 20, 1973, Ser. No. 371,860

Int. Cl. B64c *25/60*

U.S. Cl. 244—104 R **7 Claims**



1. A method for servicing fluid cushioned collapsible aircraft landing gear struts comprising: allowing an aircraft to rest and bear on its landing gear with the supporting wheels thereof in contact with a floor surface such as hangar floor, runway, or any other support; then opening a fluid fitting in each respective landing gear strut while allowing the weight of the aircraft to move downward uniformly under the force of gravity thereby collapsing said struts and thereby forcing used fluid therefrom; then applying new fluid under pressure through said fitting and thereby uniformly extending said struts and uniformly elevating said aircraft while the weight of said aircraft is still supported on said struts and while the respective wheels are still engaged with said floor surface.

3,889,905

DERAILMENT RESPONSIVE BRAKE APPLYING DEVICE

James H. Hall, Jr., 2829 Churchill, Memphis, Tenn. 38118

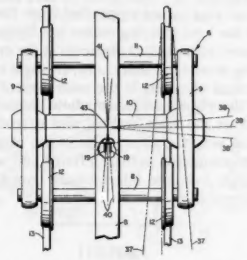
Filed Feb. 13, 1974, Ser. No. 442,056

Int. Cl. B61l *3/00*

U.S. Cl. 246—170 **3 Claims**

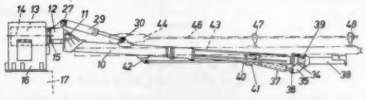
1. A derailment responsive brake applying device comprising a normally closed valve, means supporting said valve immovably on a railway car center sill, said valve including a housing having an inlet end connected to a trainline branch pipe and an outlet end opening to the atmosphere, a valve actuator connected to and extending from said housing and supported relative thereto for movement crosswise of the center sill, and a bifurcated member secured immovably to an exterior part of one side wall of a truck bolster of the railway car and having rigid functions transversely spaced relative to the center sill and between which said valve actuator is disposed, whereby a twisting or transverse movement imparted

to the bolster due to the derailment of a wheel of the truck will cause one furcation to engage and move the valve actuator to



a position to open the valve to depressurize the brake line for applying the train brakes in emergency.

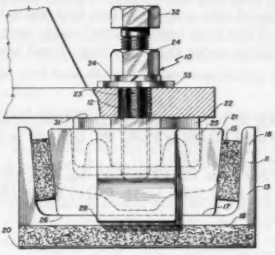
3,889,906
DRILL BOOM
Erich Voldemar Kimber, Vendelso, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden
Filed Dec. 6, 1973, Ser. No. 422,360
Claims priority, application Sweden, July 3, 1973, 7309394
Int. Cl. E21c *9/00, 5/08, 11/00*
U.S. Cl. 248—2 **10 Claims**



1. A drill boom arrangement for positioning an elongated rock drilling apparatus to different drilling positions with respect to a support comprising in combination therewith a boom bracket, a base shaft on said bracket for rotatable journalling thereof on said support about a polar axis, a first cross shaft on said bracket, a drill boom pivoted at the rear end thereof on said first cross shaft in a plane parallel with but spaced laterally from said polar axis, a second cross shaft at the forward end of said drill boom, a boom head supported on said second cross shaft for carrying said rock drilling apparatus with a free motion clearance relative to said drill boom pivotally in a plane normal to said cross shafts and passing through said polar axis, hydraulic cylinder means pivotally connected to said drill boom and further pivotally connected respectively to said boom head and to said bracket for pivoting respectively said boom head and boom, and power means for rotating said base shaft.

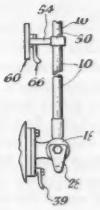
3,889,907
MACHINERY MOUNT
Paul L. DeSourdis, Millbury, Mass., assignor to The Felters Company, Millbury, Mass.
Filed Mar. 30, 1973, Ser. No. 346,417
Int. Cl. F16f *15/00*
U.S. Cl. 248—24 **6 Claims**

1. A machinery mount, comprising:
a. a pocket member having an upwardly-directed recess,
b. a nut member located in the recess and having a threaded central aperture,
c. a threaded jack extending through the aperture in the nut member and having a lower end engaging the bottom of the recess in the pocket member,
d. a base having spaced upwardly-directed flanges between which the pocket member resides, and



e. a side pad extending between each flange of the base and the pocket member, the pads being formed of felt, and the pocket member having flanges which extend downward from it.

3,889,908
OUTRIGGER POLE HOLDER
Arvid Larson, 6560 Winfield Blvd., Margate, Fla. 33063
Filed Jan. 21, 1974, Ser. No. 435,105
Int. Cl.² F16M *13/00*
U.S. Cl. 248—42 **2 Claims**



1. A pole holder, particularly useful for holding outrigger poles comprising;
a mounting base having a circular flange seat,
said flange seat used to receive a mating flange perpendicularly coupled to a bevel-toothed first crown-gear,
a clamp-ring fitting over said first crown-gear, abutting against said mating flange, and affixed to said flange seat, a second crown-gear rotatably communicating with said first crown-gear having affixed to said second crown-gear a tubular member for holding said outrigger pole root,
a circumferentially sloping cam surface on the back of said first crown-gear and a first handle with complimentary circumferentially sloping cam surfaces that abut said cam surfaces on the back of said first crown-gear,
said first handle being rotatable about the centerline of said circumferentially sloping cam surfaces and being coupled to said second crown-gear such that when said first handle rotates so that both cam surfaces closely abut, then said second crown-gear pulls toward said first crown-gear and said teeth mesh; when said first handle (is rotated) rotates such that both cam surfaces loosely abut, then said second crown-gear freely rotates about the centerline of said circumferentially sloping cam surfaces,
a second similar set of circumferentially sloping cam surfaces located on said clamp-ring and a second handle with a second similar set of complimentary circumferentially sloping cam surfaces,
said second handle being coupled to said mounting base and being rotatable about the centerline of said second cir-

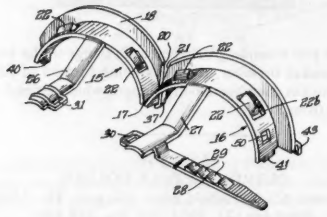
cumferentially sloping cam surfaces such that when said second handle rotates so that both cam surfaces closely abut, said clamp ring exerts a pressure on said flange and prevents said first crown-gear from rotating about the centerline of said seat and when said second handle rotates such that both cam surfaces loosely abut, said flange freely rotates about the centerline of said seat.

3,889,909

WIRE BUNDLE CENTERING GROMMET

Richard A. Koscik, Richton Park, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed June 12, 1974, Ser. No. 478,720
Int. Cl. F16l 5/00; H01b 17/26; H01r 13/58
U.S. Cl. 248—56 7 Claims



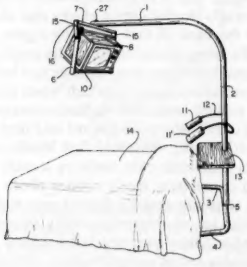
1. A wire bundle centering grommet and strain relief, comprising in combination; first and second semicircular members hinged together at mating edges to form a cylindrical body adapted to be inserted into an aperture formed in a wall panel, a flange formed at one edge of said cylindrical body to abut the peripheral margin about said aperture, tab means extending outwardly of said cylindrical body and displaced from said flange to receive the wall panel therebetween firmly to hold the cylindrical body in place, first and second arm means extending axially from said first and second semi-circular members respectively, strap means secured to said first arm means and extending transversely thereof, and fastening means formed on at least one of the said first and second arm means to receive said strap means, whereby said strap means will wrap around and be secured to a bundle of wires passing through said cylindrical body to maintain the bundle of wires centrally of said aperture in said wall panel.

3,889,910

FLOOR STAND SUPPORT AND BRACING SYSTEM

Ratus W. Walters, 5310 27th St. N.W., Washington, D.C. 20015

Filed Mar. 8, 1973, Ser. No. 339,043
Int. Cl.[2] A47G 27/00
U.S. Cl. 248—122 4 Claims



1. A floor stand support and bracing device comprising:

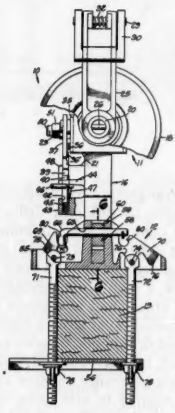
a. an elongate arm;
b. a vertical support element extending from the arm;
c. a base composed of first and second support means wherein the vertical support element is connected to the base; and
d. a load carrying means suspended from the elongate arm, wherein the load carrying means is a frame with an upper component with vertical elements at the ends thereof and extending downward therefrom, an angle iron component with vertical elements at the ends thereof and extending upward therefrom, an intermediate element with vertical elements at the ends thereof and extending downward therefrom with the extremities of the respective vertical elements connected to form a frame and wherein the said upper angle iron and intermediate components are substantially parallel.

3,889,911

CONVERTIBLE CONDUCTOR STRINGING ASSEMBLY FOR POWER LINE USE

L. E. Lindsey, Pasadena, and Herbert F. Sammons, Glendale, both of Calif., assignors to Lindsey Manufacturing Company, Pasadena, Calif.

Division of Ser. No. 259,315, June 2, 1972, which is a continuation of Ser. No. 55,056, July 15, 1970, abandoned.
This application Nov. 23, 1973, Ser. No. 418,469
Int. Cl. A47b 96/00
U.S. Cl. 248—228 6 Claims

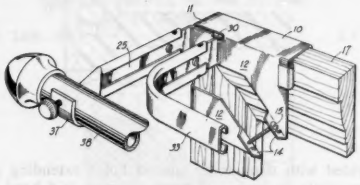


1. A support assembly clampable to a rigid four-sided member of different widths, said assembly comprising first and second clamping plates wider than the width of the four-sided member, said plates interconnected by at least two bolts, each said bolt having a shank with a radial projection adjacent one end thereof, at least one of said plates having slots formed by intersecting walls extending crosswise of the width of the four-sided member and receiving the shanks of bolts interconnecting said clamping plates, the points of intersection of said walls of said slots being spaced apart less than the width of the narrowest four-sided member to which said support assembly is to be clamped, the sides of at least one of said slots having sloping surfaces inclined relative to the adjacent side of said member and cooperating with said radial projection means on the shanks of said bolts to cam the shanks of said bolt toward the adjacent side of said four-sided member as said bolts are tightened whereby said plates and said bolts are forced into firm contact with the juxtaposed surfaces of said member.

3,889,912
CURTAIN ROD AND WINDOW SHADE BRACKET

Robert G. Ray, 1420-B N. Cliff Valley Way, Atlanta, Ga. 30319

Filed Feb. 1, 1974, Ser. No. 438,600
Int. Cl. A47h *1/10, 5/14*
U.S. Cl. 248—255 11 Claims

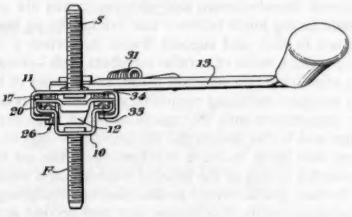


1. A curtain rod and window shade bracket comprising:
a. a sheet of metal formed to have two side portions angularly joined together at a corner adapted to be placed over corner sides of a window frame molding, two substantially coplanar face plate portions extending angularly from said two side portions adapted to be placed over the corner face of the window frame molding; and two flange portions projecting outwardly from said two face plate portions; and
b. fastening means adapted to adjustably couple together said two flange portions of said sheet of metal whereby said two side portions and said two face portions of said sheet of metal may be drawn towards one another snugly over the window frame molding corner during bracket mounting.

3,889,913
SEAT SLIDE MECHANISM

Albert John Adams, Fetcham, England, assignor to A. W. Chapman Limited, London, England

Filed May 14, 1973, Ser. No. 359,784
Claims priority, application United Kingdom, June 6, 1972, 26245/72
Int. Cl. B60m *1/08*
U.S. Cl. 248—430 4 Claims

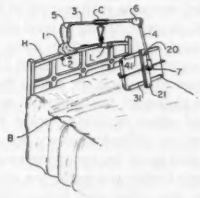


1. A seat slide mechanism comprising
a. a rail securable to a floor so as to be fixed thereto;
b. a slide securable to a seat so as to be fixed thereto, said rail and said slide being interengageable;
c. two outwardly and oppositely directed flanges on said rail, each of said flanges having a track surface, said flanges having parallel marginal portions which extend along the outer edges of said tracks and which are substantially perpendicular to said track surfaces;
d. two inwardly and oppositely directed flanges on said slide, said slide having two spaced parallel track surfaces;
e. the track surfaces on said rail flanges being in vertical register with the spaced parallel track surfaces on said slide;
f. two pairs of metal rollers in contact with said track surfaces, one of said pairs being spaced longitudinally of the rail and the slide from the other of said pairs, one roller of each pair being in contact with the track surface of one flange of said rail and with the corresponding track surface of the slide, and the other roller of each pair being in contact with the track surface of the other flange of said rail and with the other corresponding track surface of the slide;
g. two roller retainers, each of which accommodates one pair of said pairs of rollers with freedom for rotation therein as the slide is moved relative to the rail and each of which is made of a synthetic resin material having a low coefficient of friction;
h. each roller retainer comprising means defining two individual roller housings which are spaced from one another and each of which snugly accommodates and positively holds one roller of the pair associated therewith in a manner such that the roller retainer, when the seat slide mechanism is being assembled, can be held in any attitude without the rollers dropping out; and
i. each roller retainer further having parts which embrace both the flanges on said rail and the parallel marginal portions of said flanges, whereby said roller retainers position the rollers on and guide the rollers along the respective track surfaces by virtue of the accommodation of each of said rollers within the confines of its own individual housing and whereby the stability of the slide relative to the rail in directions transverse to the longitudinal axis of said rail is maintained solely by the presence of those parts of the longitudinally spaced roller retainers which are sandwiched between and are in contact with the outer faces of said parallel marginal portions of the rail flanges and the portions of the slide which are aligned therewith at any particular time.

3,889,914
BOOK SUPPORT RACK

Melvin H. Torme, 120 El Camino Dr., Beverly Hills, Calif. 90212

Filed Aug. 23, 1974, Ser. No. 500,184
Int. Cl. A47b *23/00*
U.S. Cl. 248—445 5 Claims



1. A book support comprising:
a. a base member;
b. a book supporting rack;
c. articulated arm members connected between the base member and the rack and adjustable to position the supporting rack in a desired reading position, and
d. said book supporting rack comprising an upright channel member having an intermediate point on one face connected to one of said arm members by universal joint means and opening on its other face toward the plane in which the book is to be supported; a transverse lower channel opening upwardly to support a book and the channel being fixed to said upright channel member and disposed at right angles across its other face; an upper transverse channel opening downwardly to support a book and disposed at right angles across said other face of the upright channel member and clamped thereto by slidable means so that the upper channel can be vertically

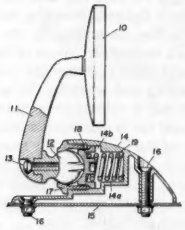
positioned thereon to accomodate different-height books; and page retaining means comprising a rod passed through horizontally aligned holes in said upright channel member and extending outwardly on each side thereof to lie between said upper and lower channels, and a helical spring having a relaxed inside diameter less than the rod diameter applied onto the rod near each of its opposed ends, and a page retaining finger extending from each of the springs and bent around to yieldably overlie and retain the pages against the book.

3,889,915

COLLAPSIBLE REAR VIEW MIRROR APPARATUS

Setsuo Hashiguchi, Yamato, and Tatsuo Watanabe, Isehara, both of Japan, assignors to Ichiko Industries Limited, Tokyo, Japan

Filed July 16, 1973, Ser. No. 379,335
Claims priority, application Japan, July 19, 1972, 47-84293
Int. Cl. B60r *1/02*
U.S. Cl. 248—475 B **5 Claims**



1. A collapsible rear view mirror apparatus for an automobile, comprising:

a rear view mirror;

a support member adapted to be fixed to the body of the automobile;

a ball and socket joint comprised of a ball element and at least two socket elements, one of said socket elements being fixed to said support member, a second socket element being movable with respect to said support member, said ball element having at least one substantial ridge on its spherical surface portion away from the portion thereof adjacent to said fixed socket element, said ridge having a spherical surface, the radius thereof being identical with the radius of the spherical surface of said ball element, said other movable socket element having at least one recess complementary in configuration and location to said ridge for receiving said ridge therein;

a mirror arm arm having two ends, one end holding said rear view mirror, the other end being secured to said ball element, said mirror arm being thereby secured to said support member; and

a coil spring provided between said support member and said movable socket element to urge both said ball element and said movable socket element toward said one fixed socket element so that said ridge is fitted in said recess, thereby holding said mirror arm in place.

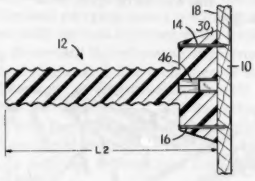
3,889,916

PLASTIC THREADED INSERT FOR FORMING VOIDS IN CONCRETE PRODUCTS

Robert John Ilukowicz, Corant, N.Y., assignor to Preco Industries, Ltd., Plainview, N.Y.

Filed Mar. 26, 1973, Ser. No. 345,183
Int. Cl. B29d *1/00*
U.S. Cl. 249—59 **8 Claims**

1. A protective plug for a concrete coil insert or the like, said plug comprising a monolithic plastic unit including a tapered head in the shape of a truncated conical form and a threaded cylindrical portion extending therefrom in concentric relation thereto, said plastic being a high density polyethylene with a density of about 0.94 to 0.97, said head being



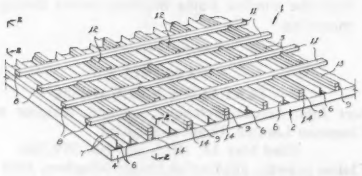
provided with diametrally spaced holes extending at least substantially through said head whereby said head can be nailed to a wooden concrete form, said head being provided with a diametral slot extending between said holes which are located symmetrically on opposite sides of the slot.

3,889,917

JIG FOR PRECAST BRICK-WALL PANELS

Donald J. Fraser, 32 Robert Ct., Para Hills, Australia (5096)

Filed Jan. 18, 1973, Ser. No. 324,848
Claims priority, application Australia, Jan. 24, 1972, 7763/72
Int. Cl. B28b *7/22*
U.S. Cl. 249—64 **4 Claims**



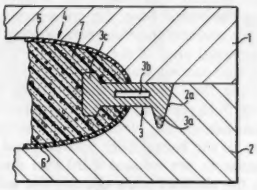
1. A jig for precasting of brick wall panels said jig including a frame on which bricks can be supported on their faces in spaced adjacent relationship for the insertion of bonding material therebetween, and wherein means are provided to mould facing joints between said bricks, the jig being characterized in that said support frame comprises a base frame supporting a series of parallel members each having a supporting edge lying in a common plane, and a series of brick aligning and joint moulding members, which members are adapted, by engagement into the spaces between adjacent bricks, to align said bricks and mould the joints and then be withdrawn from the joints to leave the bonded bricks on the support frame for curing of the bonded material; and wherein the jig is further characterized in that the brick aligning and joint moulding members comprise first and second sets of members, each of the first set adapted to interlock with the members of the second set so that the sets together can form a crossed pattern with moulding faces on each of the members of both sets having a common planar relationship which lies above said common plane; and wherein the jig is further characterized in that each member of the first set of the joint aligning and moulding members includes a bar portion of constant cross section over its mould face length, and members of the second set each includes sections of lesser height whereby to allow the crossing of the members of said first set past the members of said second set, and each member of said second set is supported by a bar of constant cross section which is removably mounted for sliding from beneath the respective member, whereby the said each member of said second set can fall perpendicularly away from the joint it has

moulded to a height less than that of said common plane and thereby permit the withdrawal in a horizontal direction of a formed panel.

3,889,918
MOULDING OF SHELLS

Helmut Stoeberl, 8201 Eggstaett-Bachham, Germany

Filed Jan. 9, 1973, Ser. No. 322,098
Int. Cl. B29d *27/00*
U.S. Cl. 249—85 **1 Claim**

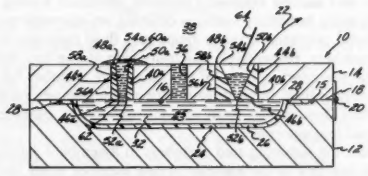


1. A connector for the opposed molded plastics shells of a plastics foam-filled structural member which comprises a strip of material having a first edge portion shaped to be anchored in the parting line between mold halves for the shells, a second edge portion opposite said first edge portion shaped to be anchored in plastics foam filling the shells, and an intermediate portion connecting said edge portions fitted to close the gap between the opposed shells, said first portion being severable from said intermediate portion, said intermediate portion carrying flaps for overlying adjoining edges of the shells in sealing relation therewith and said intermediate portion being hollow and providing a recess with an open outer periphery when said first portion is severed therefrom and said flaps being anchored in said recesses.

3,889,919
VENTING CONSTRUCTION FOR MOLDS FOR FORMING PLASTIC FOAM PARTS

Michael Ladney, Jr., 18125 E. Ten Mile Rd., East Detroit, Mich. 48021

Continuation of Ser. No. 213,299, Dec. 29, 1971, abandoned. This application Aug. 20, 1973, Ser. No. 389,708
Int. Cl. B29c *1/14*
U.S. Cl. 249—141 **3 Claims**

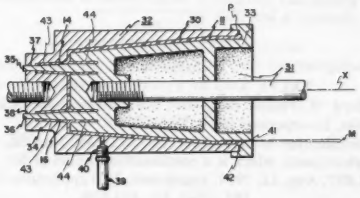


1. A mold for forming foamed plastic parts comprising, a base and a top cover thereon, said base and cover each having horizontally extending planar surfaces around the periphery thereof which, when the cover is located on said base, define a parting face therebetween, said base and cover cooperating to define a foam molding chamber therebetween in which a work-piece is adapted to be molded, said parting face extending horizontally around the periphery of said foam molding chamber, said cover being separable from said base at said parting face to provide access to said chamber, said cover having a circular cylindrical opening therein extending vertically downwardly from the top outer surface of the cover to said molding chamber, an insert having a circular cylindrical outer surface sized to fit said opening, said insert comprising an integral onepiece member formed of a plastic material selected from the group consisting of acetal, polyethylene and polypropylene, said insert filling said opening and extending upwardly from substantially flush with the cover surface forming the upper portion of said molding chamber to the top outer surface of the cover, said insert having a single vertical passageway of circular cross section extending axially therethrough and concentric with the vertical axis of the opening in the cover so that during the foam molding of the article the air in said chamber is vented vertically upwardly through said passageway and the plastic foam material in the chamber is permitted to expand into abutting relation with the inner end of said insert and into said passageway to form a plug which rises through said passageway to the top surface of the cover whereby to facilitate separation of said plug from foam molded article and to facilitate removal of said plug from within said insert.

3,889,920
MOLD STRUCTURE FOR FABRICATING FLUID COLLECTION RECEPTACLES

Legrand K. Holbrook, Salt Lake City, Utah, assignor to Medical Development Corporation, Salt Lake City, Utah

Continuation-in-part of Ser. No. 98,566, Dec. 16, 1970, Pat. No. 3,738,381. This application May 25, 1973, Ser. No. 363,850
Int. Cl. B22c *9/24;* **B29c** *1/14*
U.S. Cl. 249—151 **7 Claims**



1. A port-including container-producing mold apparatus including, in combination, unitary, elongate, positive mold means for forming the interior surface of a container and also the interior surfaces of port extensions to be integrally formed with said container; and negative mold means for forming the exterior surfaces of said container and port extensions, said positive and negative mold means being provided with intercooperating elongated pin means and guide aperture means, respectively, for constraining said positive and negative mold means to predetermined, fixed-axis axial movement, whereby to assure desired wall formation of said container, said pin means being integral with said positive mold means and extending parallel to the longitudinal axis of said positive mold means, said negative mold means being relieved about solely a portion of said pin means to form mold cavity means for said port extensions.

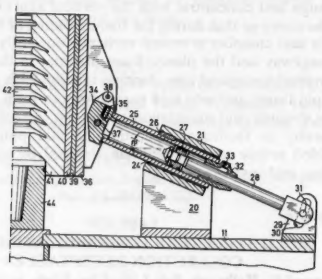
3,889,921
MOULD FOR ARTICLE WITH CIRCUMFERENTIAL UNDERCUT FLANGES

Christain Weber, Mutschellen; Alfred Puck, Basel, and Peter Voirol, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 22, 1974, Ser. No. 472,259
Claims priority, application Germany, May 28, 1973, 2327108
Int. Cl. B29c *7/00*
U.S. Cl. 249—161 **14 Claims**

1. A mould comprising a plurality of elements movable relative to one another in rectilinear paths to open and close the mould, the closed mould defining the surface of a mould-

ing with a plurality of circumferential constant-profile flanges all undercut in the same direction with the surface being generated by translation of a planar profile curve through a series of profile planes so that each point on the profile curve traverses a respective closed curve in a respective cross-sectional plane perpendicular to all the profile planes wherein: the direction of movement of each element is so inclined to



the cross-sectional planes that no part of that element penetrates into or through the surface of the moulding during movement, and

for each element the angle between all profile planes intersecting that element when the mould is closed and a movement plane perpendicular to the cross-sectional planes and containing the direction of movement of that element is less than 90°.

3,889,922

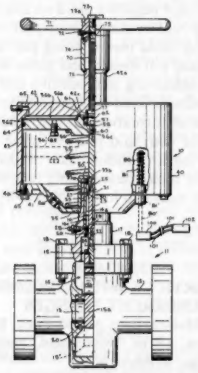
VALVE AND ACTUATOR ASSEMBLY

Clifford M. Peters, Longview, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 373,139, June 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 171,097, Aug. 12, 1971, abandoned. This application Dec. 13, 1973, Ser. No. 424,616

Int. Cl. F16k *31/14, 31/44*

U.S. Cl. 251—14 **7 Claims**



1. In a valve including a body having a transverse bore for fluid flow therethrough and having a lateral bore intersecting the transverse bore for receiving therein an element for closing and opening the transverse bore to fluid flow and a movable valve stem in the body connected to move the element in the transverse bore for opening and closing the valve, the improvement comprising:

a. first seal means mounted in the lateral bore to close off one end thereof and sealably engaging the valve stem;

b. second seal means mounted in the lateral bore in spaced relation to said first seal means to close off the other end thereof and sealably engaging the valve stem and being exposed to fluid from the transverse bore whereby a predetermined minimum force is exerted on the valve stem by the fluid in the transverse bore to aid in moving the element when closing the valve;

c. third seal means mounted on the valve stem between said first and second seal means for sealably and slidably engaging the lateral bore, the cross sectional area of the valve stem and said third seal means being larger than the cross sectional area of the valve stem where it sealably engages said second seal means; and

d. therebeing fluid passage means in the valve stem for receiving fluid pressure from the transverse bore on the upstream side of the element and discharging the fluid pressure to the lateral bore between said first and third seal means to act on said third seal means and aid in moving the element when opening the valve.

3,889,923

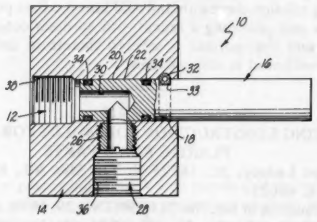
LEAKAGE RESISTANT FITTING

Eric J. Saville, Claremont, and Raymond S. Hunt, Jr., Upland, both of Calif., assignors to PneuDraulics, Inc., Montclair, Calif.

Filed May 7, 1973, Ser. No. 358,045

Int. Cl. F16k *15/08*

U.S. Cl. 251—170 **8 Claims**



1. A leakage resistant fitting for fluid handling systems comprising:

first and second relatively movable members having confronting boundary surfaces defining an intervening interfacial potential leakage space and fluid passages in said members, respectively, each opening at one end through the boundary surface of the respective member for conducting fluid through said fitting in a manner such that fluid flow occurs from one passage to the other across said leakage space,

means for retaining said members in assembled relation,

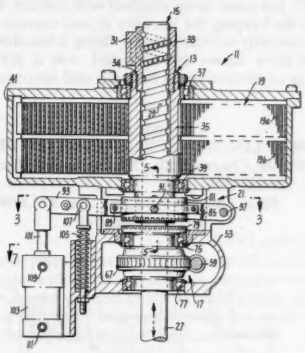
said one end of the passage in one member being reduced in diameter to form at the latter passage end a radially inwardly projecting resiliently flexible annular sealing flange formed integrally with and comprising the same material as said latter member, said flange surrounding said one end of the passage in the latter member and being bounded at one side by said boundary surface of the latter member and at the other side by a surface facing the opposite end of the latter passage, and

a compression sleeve threaded in the passage in said one member between said sealing flange and opposite passage end and engageable with said latter sealing flange surface for urging said sealing flange into fluid sealing contact with the boundary surface of the other member to block fluid leakage through said space.

3,889,924
VALVE STEM OPERATOR

Anatole N. Karpenko, San Francisco, Calif., assignor to Anchor/Darling Valve Company, Hayward, Calif.

Filed Dec. 3, 1973, Ser. No. 421,146
Int. Cl. F16k *31/53*
U.S. Cl. 251—249.5 **7 Claims**



1. A fail safe valve operator, comprising: a valve body having a valve seat therein; a valve member mounted in the valve body for movement toward and away from the valve seat to closed and open positions, respectively; a valve stem connected with the valve member to move the valve member between its open and closed positions; motor means operatively connected with the valve stem to operate it to one of said positions; clutch means connected between the motor means and valve stem to selectively engage and disengage the motor means from the valve stem; and spring means connected with the valve stem so that when said valve stem is operated to its said one position energy is stored in the spring means, and when said clutch means is disengaged to disengage said motor means from the valve stem, the spring means acts on the valve stem to return the valve member to its other position.

3,889,925
GATE VALVE AND SEAL

Robert C. Brooks, Houston, Tex., assignor to Armco Steel Corporation, Middletown, Ohio

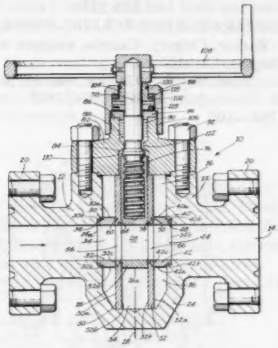
Filed Aug. 31, 1973, Ser. No. 393,614
Int. Cl. F16k *3/316*
U.S. Cl. 251—327 **26 Claims**

14. In a gate valve of the type having a valve body formed with a flow passage, a cylindrical valve chamber having a vertical axis formed in said valve body and intersecting said flow passage to define opposed inlet and outlet openings in said chamber, and a gate member movable across said valve chamber for opening and closing said flow passage, the improvement, in combination therewith, comprising:

a. a circular recess formed in the wall of said valve chamber and encircling each said inlet and outlet opening, said circular recesses being concentric;

b. a cylindrical, disc-like body sleeve secured in each said circular recess, each said body sleeve having an innermost planar end and an aperture therethrough in alignment with its perspective opening in said chamber; and

c. opposed, parallel, spaced apart seat plates vertically disposed in said valve chamber to define a channel for movement of said gate member, each said seat plate having an outermost surface and being disposed between said gate member and one of said body sleeves and having an aperture therethrough in alignment with its respective aperture in its respective body sleeve and its respective opening in said chamber, each said body sleeve being disposed in its entirety between the wall of said valve chamber and one of said seat plates with the innermost planar end of said body sleeve lying in a plane abutting the outermost surface of said seat plate;



whereby said valve body, through said body sleeves, fully supports said seat plates under thrust load of pressure, maintains flatness inspite of body distortion due to pressure, line strains and temperature, and maintains circularity inspite of valve body distortion and side thrust due to gate member friction drag.

3,889,926
METHOD FOR SHIFTING LOADS

Nils Harald Ahlgren, Skyttevagen 22, 133 00 Saltsjobaden, Sweden

Filed Nov. 19, 1973, Ser. No. 417,141
Int. Cl. B66f *1/00*
U.S. Cl. 254—1 **6 Claims**

1. A method of producing a repeated movement of gripping elements associated with piston elements of hydraulic jacks with respect to a lifting element passed therethrough by means of alternately operating pairs of hydraulic jacks consisting of cylinder and piston elements each having both a supply side and a pressure side with respect to the piston element, including the steps of supplying the pressure sides of the jacks with pressure medium and interconnecting the pressure sides of the jacks in such a manner as to form a closed pressure medium system;

connecting the supply sides of the jacks to an external pressure source for supplying pressure medium so that said supply sides are alternately supplied with pressure medium; the pressure medium in said closed system being caused to flow between the pressure sides of the jacks

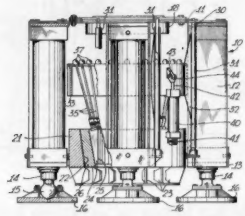
when movement of the gripping elements of said hydraulic jacks is caused by supply of pressure medium to one or the other of the pressure sides thereof.

3,889,927

APPARATUS FOR PULLING DRILL PIPE

Floyd W. Becker, Calgary, Canada, assignor to Drill Systems Inc., Calgary, Canada

Filed May 8, 1974, Ser. No. 467,972
Int. Cl. B66f 1/04, 1/00
U.S. Cl. 254—105 7 Claims



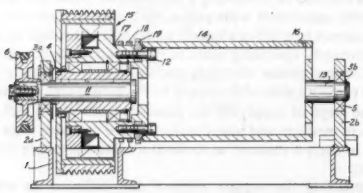
1. Apparatus for pulling drill pipe comprising
a frame,
a plurality of jack means with surface-engaging feet for raising and lowering said frame with respect to said feet, slip bowl means mounted to said frame and having an inner surface tapering inwardly in a direction towards said feet,
a plurality of slips having a wedge-shaped configuration mounted within said slip bowl means, said slips having one surface tapered to engage said inner surface of said slip bowl means and the other surface arranged for engagement with the outer surface of a drill pipe,
a control member mounted for limited movement in a direction to and from said slip bowl means,
a plurality of connecting members connecting each slip to said control member, and
means to move said control member away from said slip bowl means to cause said slips to move along said tapered surface of said slip bowl means for effecting disengagement of said slips from a drill pipe.

3,889,928

WINCH WITH CONSTANT TENSION CABLE

Pierre Y. David; Joel M. Charles, both of La Valette, and Robert Julien Antoine Toscano, La Seyne, Mer, all of France, assignors to Etat Francais, Paris, France

Filed Dec. 10, 1973, Ser. No. 423,528
Claims priority, application France, Dec. 11, 1972, 72.43940
Int. Cl. B66d 1/00
U.S. Cl. 254—172 3 Claims



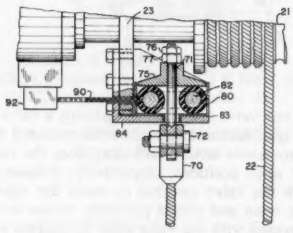
1. A constant tension winch for drawing a cable with a load comprising, in combination:
a rotatable reel on which a cable can be wound or unwound, the tension of said cable being kept substantially constant;
constant speed drive means comprising a drive shaft with continuous constant rotation in the same direction independent of whether the cable is wound or unwound;
an eddy current electrobrake including a spooled rotor secured to said reel and a stator secured to said drive shaft, the rotor being supplied with current; and
means for keeping the intensity of said current constant,
a substantially constant torque being transmitted between said drive means and said reel over a predetermined range of relative speed between said stator and rotor.

3,889,929

FORCE LIMITED POWER ACTUATED DEVICE

Karl A. Pamer, Chagrin Falls, Ohio, assignor to McNeil Corporation, Akron, Ohio

Filed June 25, 1973, Ser. No. 374,669
Int. Cl. B66d 1/48
U.S. Cl. 254—173 B 2 Claims



1. In a motor-driven hoist, a frame, having an upwardly facing abutment surface, a cable drum rotatably supported by said frame, an electric motor supported by said frame and connected to said cable drum for rotating said cable drum, a resilient flexible closed toroidal shaped elastomer vessel filled with fluid supported on said abutment surface, a member supported on the upper side of said closed vessel, cable means having one end connected to said cable drum and its other end connected to said member supported on the upper side of said closed vessel, a load grab connected to said cable means, and an electric control circuit for selectively operating said motor, said control circuit including a normally closed pressure responsive switch connected to said vessel and responsive to fluid pressure in said vessel in excess of a predetermined amount for preventing operation of said motor.

3,889,930

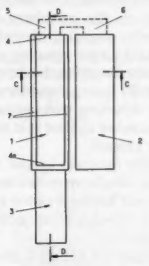
APPARATUS FOR ELIMINATION OF SURFACE WATER FROM ARTICLES

Jean-Claude Vitat, Antony; Jean-Robert Thebault, Paris, and Jean-Pierre Remond, Massy-Villaine, all of France, assignors to Rhone-Progil, Courbevoie, France

Filed Feb. 14, 1974, Ser. No. 442,373
Claims priority, application France, Feb. 15, 1973, 73.05345
Int. Cl. B01f 15/06
U.S. Cl. 259—4 18 Claims

1. Apparatus for removing water from the surface of an article by immersion in a liquid composition which is immiscible with water, comprising a water removal tank, a rinsing tank, a water settling tank, a recycling circuit for passing liquid composition from the water settling tank to the water removal tank, the water removal tank having a liquid inlet connected to a liquid outlet of the rinsing tank, heating means for heating liquid composition in the water removal tank, and an overflow device extending around at least 40% of the

periphery of the water removal tank, in which the water removal tank, the liquid inlet, the overflow device and the heating means possess a common vertical plane of symmetry and in which the water removal tank, the rinsing tank and the water settling tank are so disposed that at least a portion of the



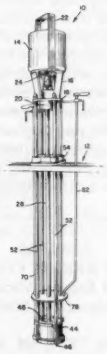
vertical planes perpendicular to said plane of symmetry and intersecting the water removal tank also intersect the rinsing tank, and at least a portion of the vertical planes parallel to said plane of symmetry and intersecting the water removal tank also intersect the water settling tank.

3,889,931

HOMOGENIZER-MIXER

Robert E. Adams, Topsfield, Mass., assignor to J. W. Greer, Inc., Wilmington, Mass.

Filed Apr. 12, 1974, Ser. No. 460,362
Int. Cl. B01f *5/16*
U.S. Cl. 259—96 **15 Claims**



1. A device for mixing a liquid in a vessel, said device comprising:

a. a frame disposed along an axis, and

b. means for producing flow patterns, said means including:

i. a shaft disposed for rotation along said axis within said frame, said shaft having projecting vanes disposed for rotation about said axis,

ii. a stator mounted to said frame and disposed about said axis, said stator having a body and a head, said body and said head axially movable with respect to each other between first and second positions, said body and said head being engaged when in said first position and disengaged when in said second position, said vanes disposed within said stator when said head and said body are in said first position, at least a portion of said vanes exposed when said head and said body are in said second position, and

iii. drive means mounted to said frame and operatively connected to said shaft, said drive means rotating said shaft,

c. with said vanes rotating and said body and said head in said first position, said device produces a first flow pattern;

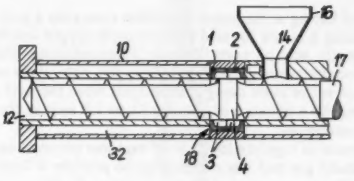
d. with said vanes rotating and said body and said head in said second position, said device produces a second flow pattern, said first flow pattern distinguishable from said second flow pattern.

3,889,932

WORM THROTTLE MEANS

Curt Brandis, Westerhof, and Oskar Schatz, Neu-Leversen-Harburg, both of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Sept. 12, 1973, Ser. No. 396,996
Claims priority, application Germany, Sept. 16, 1972, 2245570
Int. Cl. B29b *1/06;* **B29f** *3/02*
U.S. Cl. 259—191 **7 Claims**



1. In a worm extruder a cylinder having a feed opening near one end and a discharge at the other end, an extrusion worm rotatable in said cylinder for advancing material from said feed opening along said cylinder to said discharge, flow restricting means in said cylinder disposed a predetermined distance downstream from said feed opening and operable to control the quantity of material advanced along said cylinder by said worm, the diameter of said worm being substantially equal to the internal diameter of said cylinder, a collar formed on said worm in the axial range of said flow restricting means and having a cylindrical inner surface substantially the same diameter as said worm, the internal diameter of said flow restricting means being substantially equal to the diameter of said collar, groove means formed radially into said flow restricting means from the inside and extending therealong from one axial side of said collar to the other to provide passage means for the flow of material past the collar, said flow restricting means comprising a pair of rings in end to end relation, a portion of said groove means being formed in each said ring, and means for adjusting said rings relatively in the angular direction thereby to vary the registration of the groove means in the respective rings and in that manner to vary the effective flow area through said flow restricting means.

3,889,933

METALLURGICAL LANCE

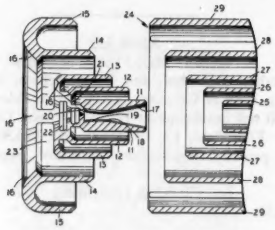
Louis Harold Jaquay, Pittsburgh, Pa., assignor to The International Nickel Company of Canada, Ltd., Toronto, Ontario, Canada and Dravo Corporation, Pittsburgh, Pa.

Filed Feb. 28, 1974, Ser. No. 446,688
Int. Cl. C21c *7/00*
U.S. Cl. 266—34 L **5 Claims**

1. A system for supplying heat and process oxygen to a metallurgical operation comprising:

1. a lance consisting of at least four nesting pipes spaced apart from one another,

2. means connected to one end of the lance
   a. to supply high pressure oxygen to the centermost pipe,
   b. to supply low pressure oxygen and air to at least one conduit between the nesting pipes,
   c. to supply natural gas to one other conduit between the nesting pipes,
   d. to supply and circulate water within the outermost conduit between said nesting pipes;
3. a tip affixed to the other end of said lance and enclosing said conduit carrying water, comprising a concave end



wall having at the point of greatest concavity a port comprising a nozzle for said high pressure oxygen and having arcuate sets of ports therein communicating with the conduits carrying low pressure oxygen, natural gas and air each set of ports being spaced apart from the next set of ports by a distance of about 0.75 to 1.5 inch in the axial direction and

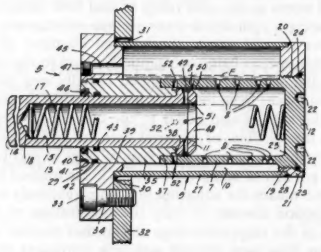
4. means to regulate the flow of said low pressure oxygen, natural gas and low pressure air to provide at least 10% of the oxygen needed for combustion of said natural gas in the form of low pressure oxygen.

3,889,934

HYDRAULIC BUFFER

Gordon W. Kamman, Elma, N.Y., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Dec. 19, 1973, Ser. No. 426,233
Int. Cl. B60g *11/56*
U.S. Cl. 267—34 **1 Claim**



1. A hydraulic buffer especially suitable for heavy duty uses, comprising:

a tubular housing defining a hydraulic fluid reservoir and having permanently attached opposite end closures of substantial thickness provided with concentric respective openings and with the opening in one of said closures being of larger diameter than the opening in the other of said closures;

said other closure having adjacent to the outer end of its opening an inwardly facing integral shoulder;

a tubular piston rod guide member having an end portion engaged in said other closure opening with an outwardly facing shoulder engaging said inwardly facing shoulder and said tubular member projecting inwardly from said other closure;

said tubular member having an inner end portion shoulder facing inwardly;

a one-piece generally cup-shaped combination cylinder and integral end closure having an inner end engaging said inner end portion shoulder of said member and having external threads on the periphery of said integral end closure threadedly engaging threads on said one end closure within said larger opening and by means of the thread engagement thrusting the inner end of the cylinder against the inwardly facing shoulder on said tubular member and thereby thrusting said outwardly facing shoulder on the tubular member against said inwardly facing shoulder of the other closure;

a piston reciprocably movable in said cylinder between the inner end of said tubular member and said integral cylinder end closure and having a piston rod slideably engaged in said tubular member and projecting substantially outwardly therefrom;

said piston and piston rod having a blind end bore opening inwardly and having a coiled compression biasing spring extending from the bore and seated on said integral cylinder end closure for normally biasing the piston outwardly into stopped engagement against said inner end of the tubular member;

said cylinder having a longitudinal series of metering orifices therethrough communicating the cylinder with the reservoir defined by said housing;

said piston being of smaller diameter than the surrounding wall of the cylinder and having an annular peripheral groove opening toward the cylinder wall;

a check valve ring mounted in said groove and having an outside diameter to engage in slideable sealing relation with the cylinder wall, the ring being narrower than the width of said groove;

ports in said piston effecting communication between said bore and said groove;

relief port means through said cylinder outwardly relative to the inner end of said tubular member and effecting communication between said reservoir and the cylinder at the side of said piston adjacent the tubular member; and

said check valve ring acting within said groove to block communication between said ports and said outer side of the piston during inward compression stroke movement of the piston, and the ring displacing to the opposite side of the groove and opening communication between the ports and said outer side of the piston when the piston moves outwardly in a return stroke.

3,889,935

VEHICLE BODY HEIGHT CONTROL VALVE

Walter C. Palm, Grand Rapids, Mich., and James E. Lyon, Perrysburg, Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Jan. 23, 1974, Ser. No. 435,671
Int. Cl. F16f *9/34*
U.S. Cl. 267—65 D **9 Claims**

1. A height control valve adapted for mounting operatively between a sprung member and an unsprung member of a vehicle, comprising:

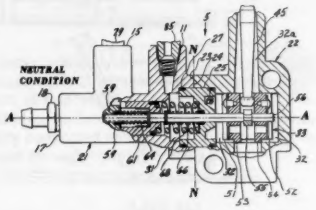
a housing having an inlet port for receiving a supply of fluid under pressure, an outlet port for supplying a fluid to a fluid actuated spring, an exhaust port for discharging unneeded fluid from the valve after passing therethrough from said spring;

said housing adapted for fixed connection to one of said vehicle members comprising first and second portions through which extends an elongate circular chamber concentric to an axis;

actuating mechanism housed in said first portion comprising an exterior lever adapted for connection with the other of said vehicle members, a valveactuating rod located sub-

stantially and coaxially within that part of said chamber in said first housing portion, and resilient overtravel means and lost-motion time-delay means for transmitting movements of said lever to said rod;

valve mechanism housed in said second portion comprising a valve assembly independently movable along with said rod as a unit lengthwise of said chamber, said valve mechanism being responsive to axial movement of the rod from a neutral or first position in one direction to a second position providing passage of fluid from said inlet port to said outlet port, and to a third position in the opposite axial direction enabling passage of fluid from said outlet port to said exhaust port;



spring seat means facing toward said exhaust port fixed along, and within, said chamber in spaced relation with the end of said assembly nearer said first housing portion; spring means positioned between said seat means and said nearer end of said assembly; and

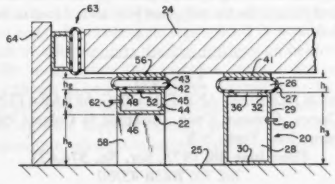
thrust means located adjacent the end of the chamber in said second portion further away from said first portion engaging the other end of said assembly and being connected with the second portion in axially adjustable relation therewith to engage said assembly and change the position thereof toward or away from said time-delay means to establish different neutral positions of said rod; said time-delay means being arranged with respect to said rod to vary the time interval between movement of said lever and responsive movement of said rod in accordance with the neutral position of said rod.

3,889,936

COMBINED AIR MOUNTS

Kazuya Shimizu, Tokyo, Japan, assignor to Barry Wright Corporation, Watertown, Mass.

Filed Apr. 12, 1974, Ser. No. 460,343
Int. Cl. F16f *5/00*
U.S. Cl. 267.65 R **15 Claims**



1. In combination with a load mounting base, at least one pneumatic assembly for dynamically supporting said base, said assembly comprising:

a first pneumatic spring system for supporting said load mounting base and providing isolation of relatively high frequency and relatively low amplitude vibrations, said first spring system comprising an air spring having a bellows and a tank with said bellows and tank being filled with a fluid under pressure and being connected by a relatively large opening so that fluid can flow relatively unobstructed from said bellows to said tank and vice versa;

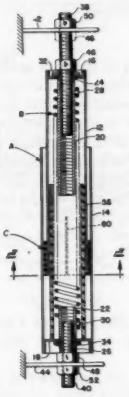
a second pneumatic spring system for damping relatively low frequency, relatively large amplitude vibrations, said second spring system being disposed in parallel to said first spring system and comprising an air spring having a bellows and a tank with said bellows and tank being filled with a fluid and being connected by a relatively small orifice whereby flow of fluid from said bellows to said tank and vice versa is restricted by said orifice, the stiffness of said second spring system being substantially less than the stiffness of said first spring system.

3,889,937

FRICTION-TYPE SHOCK ABSORBER

Lowell E. Statler, Box 115, Bellevue, Ohio 44811

Filed Jan. 16, 1974, Ser. No. 433,870
Int. Cl. F16f *11/0*
U.S. Cl. 267—9 C **15 Claims**



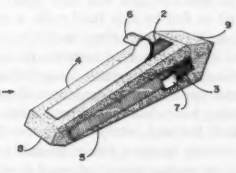
1. A shock absorber assembly including telescoped inner and outer tubes movable axially relative to one another, friction material secured to one of said tubes in compression between said tubes for resisting such relative axial movement of said tubes, said friction material having a substantially uniform static and kinetic coefficient of friction.

3,889,938

GAS PEDAL BIASING DEVICE

Robert Brand, 3568 Markam, Las Vegas, Nev. 89121

Filed Mar. 8, 1974, Ser. No. 449,216
Int. Cl. F16f *1/32*
U.S. Cl. 267—153 **4 Claims**



1. A device for imposing increasing resistance on a freely suspended accelerator pedal of a motor vehicle as the pedal is depressed comprising a resilient foam sponge wedge having compressibility characteristics such that the wedge is compressed to 50% of its normal thickness when the wedge is

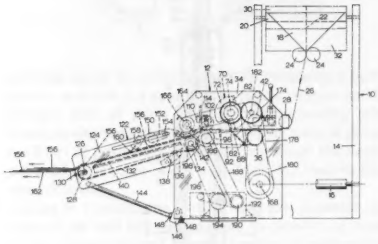
subjected to a pressure of between about 0.25 and 0.50 psi, said wedge having the shape of an elongated four-sided figure having an increasing cross-sectional area substantially along its length and being adapted to fit between the accelerator pedal and the opposing floorboard such that the pedal is biased toward its idling position by the resiliency of the wedge when the pedal is depressed.

3,889,939

AUXILIARY CUT-OFF UNIT FOR WEB PRINTING PRESSES AND METHOD OF FORMING SEVERED PIECES

Hans G. Faltin, York, Pa., assignor to Advance Enterprises, Inc., York, Pa.

Filed Dec. 4, 1972, Ser. No. 311,627
Int. Cl.[2] B41F *13/56*
U.S. Cl. 270—21 7 Claims



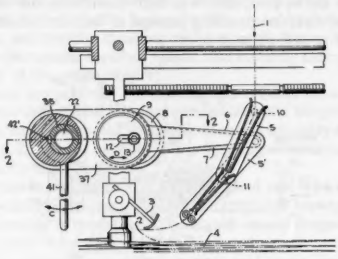
1. An auxiliary in-line rotary cutoff unit adapted to be connected to and driven directly by a web printing press to provide the same with capabilities of producing from a longitudinally folded or unfolded continuous flexible web of one or more thicknesses of precise width printed pieces each having precisely uniform lengths cleanly and evenly severed on all cut edges and requiring no additional trimming, said cut-off unit comprising in combination, a frame, a pair of cooperating feed rolls supported by said frame and adapted to receive and feed a longitudinally folded or unfolded printed web directly from a web printing press, means operable to drive said feed rolls at a fixed surface speed substantially equal to the speed of the web discharged from said press, a rotary cutting member comprising a cylinder having at least one shearing blade extending longitudinally thereon and radially adjustable relative to the axis of said cylinder and said blade being engageable with said web as fed by said feed rolls, a drive shaft for said cylinder of said rotary cutting member supported by said frame, a bed knife supported stationarily by said frame adjacent said cylinder and adjustable towards and from said cylinder for precise shearing engagement with said shearing blade of said cylinder, and adjustable drive means interconnected to said drive shaft for said rotary cutting member adapted to be connected directly to drive means on said printing press, said adjustable drive means being adapted to vary the rotational speed of said rotary cutting member relative to the speed of said web fed thereto to cause said blade of said rotary cutting member to engage said stationary bed knife to sever said web transversely into precise desired uniform lengths smoothly and evenly at opposite ends of the pieces thus severed which comprise finally trimmed pieces having precise finished lengths and widths.

3,889,940

DEVICE FOR ADJUSTMENT OF OSCILLATION AMPLITUDE ON ZIGZAG FOLDING APPARATUS

Hans Jakob, Darmstadt-Eberstadt, Germany, assignor to Maschinenfabrik Goebel GmbH, Darmstadt, Germany

Filed July 10, 1973, Ser. No. 378,009
Claims priority, application Germany, July 10, 1972, 2233879
Int. Cl. B65h *45/00*
U.S. Cl. 270—61 F 4 Claims



1. In a folding apparatus for printing machines including reciprocating guide channel devices for delivering a web of paper or other material downwardly from a web conveyor device in zigzag folds, driving means for each guide channel device being provided at opposite side edges of the web, said driving means including rotatable cams supporting each said guide channel device for reciprocating same upon rotation of the cams, each cam being mounted on a drive shaft, gear means operatively interconnecting the drive shafts to effect synchronous rotation of the cams; drive means in operative engagement with at least one of said drive shafts; means connected with said guide channel devices for quickly and positively adjusting the oscillation amplitude thereof, each of said cams having an elongated opening extending therethrough, fastening means extending through said openings for mounting said cams to their respective drive shafts, a surface of each said cam adjoining a surface of its respective shaft when mounted thereto, the adjoining surfaces between said respective cams and said drive shafts being roughened, said surface of each of said drive shafts being provided with a groove extending parallel to said elongated openings, and each of said cams having nose portions extending into respective ones of said grooves, whereby each said cam may be shifted by actuation of said adjustment means with respect to its respective drive shaft upon a loosening of said fastening means and, upon tightening said fastening means, said roughened surfaces serve to positively maintain the adjusted position of said drive channel devices.

3,889,941

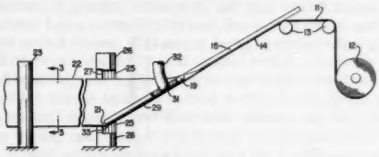
WEB FEEDING AND FOLDING APPARATUS

David Clancy, Canaan, Conn., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed June 28, 1973, Ser. No. 374,625
Int. Cl. B65h *45/00*
U.S. Cl. 270—69 6 Claims

1. In apparatus for feeding and folding a web of envelope forming material to an upwardly open substantially V-shape, an inclined metal forming plate having a flat, impervious, substantially triangular, planar, smooth bottom surface that is decreasingly laterally tapered toward its lower end, means for passing an initially flat web to and drawing it downwardly along said impervious surface, said impervious surface having a laterally extending zone wherein the width of the moving web becomes substantially equal to the width of said impervious surface and comprising the beginning of a forming region

extending between that zone and the lower end of said impervious surface and wherein the moving web is gradually folded to said V-shape, said plate having a through opening that is substantially centrally located laterally in said forming region and a conduit connection from a source of air under pressure to said opening at the upper surface of said plate for introducing air under relatively low pressure between said web and said bottom surface in said forming region for facilitating movement of said web as it is drawn down said bottom surface, said plate further having a portion in said forming region detachably connected to said plate member and said portion having said through opening therein.

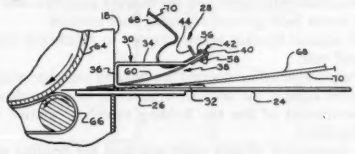


3,889,942

DEVICE FOR FACILITATING THE FEEDING OF SHEETS INTO A REPRODUCTION MACHINE OR THE LIKE

Wilber B. Robnolte, 920 E. Elm St., Lima, Ohio 45804

Filed Oct. 23, 1973, Ser. No. 408,475
Int. Cl.[2] B65H *5/38;* **G03B** *27/02*
U.S. Cl. 271—3 **8 Claims**



8. A device for facilitating entry of sheet material into a reproduction machine, said machine having a supporting surface adjacent an elongate entry opening of the machine, said device comprising two spaced supports to be located on said surface near opposite ends of the entry opening, a stiffening bar extending between said supports, and an entry strip affixed to said stiffening bar and having a forward edge extending toward the entry opening when said supports are on said supporting surface, each of said supports being of generally U-shaped configuration with lower and upper generally horizontally extending elongate legs positioned substantially perpendicular to said stiffening bar, and a web connecting common ends of said elongate legs spaced from said stiffening bar, each of said supports thereby forming an opening facing outwardly away from the machine toward the operator, whereby sheets to be copied can be inserted into the support opening and extend outside the support and then be moved back through the support opening toward the center of the entry opening to straighten corner portions of the sheets.

3,889,943

PLATEN TRANSPORT FOR AUTOMATIC DOCUMENT HANDLER

Harry J. Krayer, III, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 26, 1974, Ser. No. 464,394
Int. Cl. B65h *9/06*
U.S. Cl. 271—4 **5 Claims**

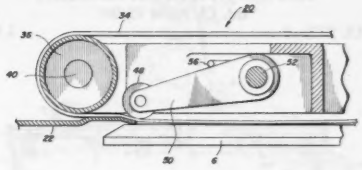
1. In a document handling apparatus for moving documents into copying position on the platen of a document copying machine, the combination of:

a flexible document transport belt;

a pair of interior support rolls about which said belt is operatively disposed, said support rolls being spaced apart to support said transport belt opposite to and extending across at least a portion of said platen;

means for rotatably supporting each of said rolls so that the surface of said transport belt therearound is spaced slightly above the plane of said platen whereby said belt operating run adjacent said rolls is spaced above and out of document driving relationship with said platen;

a register edge movable into and out of the document path adjacent said platen; and



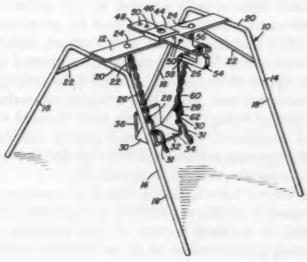
internal pressure means adapted to force a line portion of said belt operating run downwards towards said register edge into document driving relationship with said register edge when said register edge is in the document path for positively driving documents onto said platen between said register edge and the line portion of said belt thereagainst, normal sag in said transport belt allowing said belt to contact said platen between said support rolls for moving the document across said platen while preventing contact of the platen belt with the platen glass adjacent said register edge.

3,889,944

OCCUPANT PROPELLED SWING

Salvatore Sapienza, 133 Woodland St., Lawrence, Mass. 01841

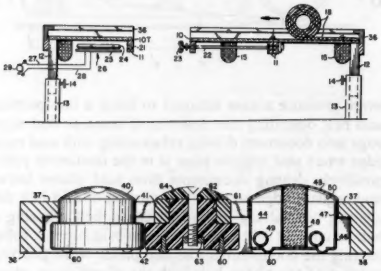
Filed Jan. 2, 1974, Ser. No. 429,713
Int. Cl. A63g *9/16*
U.S. Cl. 272—90 **10 Claims**



1. A swing construction including an elongated support having front and rear sides and opposite ends, said support having longitudinally spaced anchor means, a pair of depending tension members attached at their upper ends to said anchor means, a child's swing seat structure suspended from and between the lower end portions of said tension members, a depending pivot link including upper and lower anchor points, mounting means pivotally supporting the upper anchor point of said link from said support for angular displacement of said link about a horizontal axis generally paralleling and disposed substantially forward of a first vertical plane containing said spaced anchor means, an elongated upstanding flexible pull member secured at its upper end to said lower anchor point and freely depending, by gravity, from said lower anchor point with its lower end portion suspended slightly forward of

said plane, said link being of a configuration and weighted such that when said link hangs free on said upper anchor point with said pull member suspended therefrom said lower anchor point is spaced substantially rearward of a second vertical plane paralleling the first plane and passing through said upper anchor point and forward of said first plane.

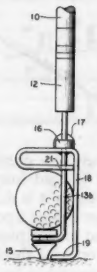
3,889,945
BILLIARD TABLE WITH ACCESSORIES
Robert Ellis, 350 Lomas Santa Fe Dr., Solana Beach, Calif. 92075
Filed Apr. 19, 1973, Ser. No. 352,602
Int. Cl. A63d *15/00*
U.S. Cl. 273—6 **2 Claims**



1. In a billiard table with associated accessories, a horizontally disposed level playing surface, a horizontally disposed level surface under said playing surface forming a support therefor, holes through said support surface defining pockets, said support surface and said playing surface being surrounded by a raised border, said playing surface comprising a thin integral sheet of plastic material which is adapted to be reversible on top of said support surface, holes through said sheet of material adapted to mate with the holes in said support surface, billiard balls adapted to roll across one surface of said sheet of plastic material and be propelled into said pockets when said one surface is uppermost, said one surface being pliable and sufficiently soft and roughened to gradually retard the speed of one of said billiard balls rolling thereover, the opposite surface from said roughened surface of said plastic material being considerably more smooth and slippery than said roughened surface, and gliders adapted to slide across said opposite surface and be propelled into said pockets when said opposite surface is uppermost.

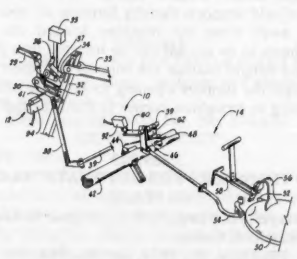
2. In a billiard table with associated accessories, a horizontally disposed level playing surface, said playing surface being surrounded by a raised border of rigid material, said raised border being positioned so as to be elevated above and protruding inwardly over said playing surface by support means, the protruding portion of said raised border having an inner edge, a plurality of similarly associated gliders adapted to slide across said playing surface and to impact into said inner edge of said raised border, each gliders having a centrally upstanding rigid projection thereon with an elastic rubber ring tightly slipped over said upstanding projection, a bulbous circular projection below said rubber ring and extending radially outward therefrom, said bulbous projection being of rigid plastic material, the elevation of said rubber ring on said glider being level with the elevation of said inner edge above said playing surface such that said rubber ring will rebound from said inner edge, whereas the elevation of said circular projection above the playing surface is such that similar gliders will rebound therfrom, yet said circular projection will slide beneath said raised border.

3,889,946
PORTABLE ADJUSTABLE TEE AND BALL POSITIONING DEVICE
John C. Setecka, 1931 S. Austin Ave., Cicero, Ill. 60650
Filed July 5, 1973, Ser. No. 376,817
Int. Cl. A63b *57/00*
U.S. Cl. 273—33 **5 Claims**



4. A golf tee positioning device adapted to press tees into desired ball supporting position, comprising
an elongated grippable outwardly extending shaft;
a passaged tee holding member having an angularly bent recessed end portion in which a tee is adapted to be releasably mounted, said tee holding member being connected to one end of said shaft;
a metal angular bracket having its upper portion slidably mounted relative to said tee holding member, and having a lower bent ground engaging foot portion;
said angular bracket being adapted to releasably support a golf ball;
an adjustable collar on said tee holding member adapted to press against the angular bracket to limit the downward movement of the tee holding member relative to said bracket;
the depression of said shaft and said tee holding member being adapted to press a ball superposed on a tee, and adapted to press the tee into ground engaging position;
the transverse movement of said tee holding member being adapted to disengage same from a tee to permit a ball to be retained on said tee.

3,889,947
CONTROLLER FOR AUTOMATIC PINSETTER
John R. Short, 5316 E. Harry, Wichita, Kans. 67218
Filed Oct. 23, 1973, Ser. No. 408,612
Int. Cl. A63d *5/09*
U.S. Cl. 273—43 A **12 Claims**



1. In an automatic bowling pinsetter having a pin distribution system powered by an electric motor, a clutch means connected to said motor, a raisable and lowerable means of said pin distribution system to receive bowling pins and set

same on a bowling lane, a controller therein and therewith, comprising:

a. a first switch means mounted with said pinsetter operable by motion of said raisable and lowerable means and electrically connected to said motor, and

b. second switch means mounted with said pinsetter operable by motion of said clutch means and electrically connected in parallel relation to said first switch means,

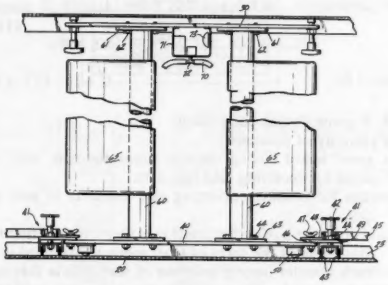
said motor being controlled by said first switch means and said second switch means, said motor being operable when either said first switch means or said second switch means are in a closed relation, said motor being not operable when both said first switch means and said second switch means are in open relation, said raisable and lowerable means and said clutch means having operating cycles such as to maintain one or the other of said switch means closed only for a sufficient period of time during the cycling of the pin distribution system to enable the pin distribution system to perform the pin handling operations required of it.

3,889,948

FOOTBALL BLOCKING TRAINING APPARATUS

John Visco, 334 Jeffer St., Ridgewood, N.J. 07450

Filed Sept. 6, 1973, Ser. No. 394,730
Int. Cl. A63b *67/00*
U.S. Cl. 273—55 A **8 Claims**



1. A football training apparatus comprising:

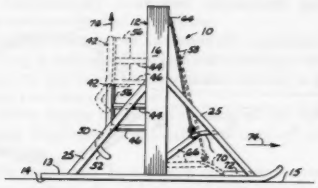
a generally rectangular frame member having spaced apart upright supports; upper and lower elongated guide members, said upper guide member being attached at each of its ends to said frame member and extending longitudinally therewith, said lower guide member being attached to the ground against movement relative thereto, said lower guide member also being positioned directly below in the same vertical plane with said upper guide member and being parallel therewith; upper and lower vertically spaced plates, said upper and lower plates being positioned, respectively, adjacent said upper and lower guide members and parallel therewith, said upper and lower plates being rigidly attached to each other by a pair of horizontally spaced vertical arms for maintaining said vertical spacing; friction means provided on said upper and low plates for frictionally engaging respectively, said upper and lower guide members; means provided on said lower plate for adjusting the amount of frictional engagement; a pair of flexible dummies secured to each of said arms for engagement by a player in an attempt to move said dummies against the frictional engagement of said friction means and guide members.

3,889,949

FOOTBALL BLOCKING SLED

John E. Gardner, 4840 Koelsch Dr., Oklahoma City, Okla. 73117

Filed Oct. 15, 1974, Ser. No. 514,856
Int. Cl. A63b *67/00*
U.S. Cl. 273—55 R **4 Claims**



1. A football blocking sled, comprising:

an upright frame;

a pair of spaced-apart parallel runners transversely supporting said frame, each said runner having a flat surface adapted to engage the ground;

carriage means vertically movable within said frame;

a pair of blocking pad supports;

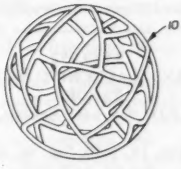
means mounting said blocking pad supports to said carriage; carriage moving means connected with said carriage; and, an operator's platform supported by said runners opposite the position of said blocking pad supports.

3,889,950

FLEXIBLE GEODESIC-TYPE TOYS

Peter B. Kasravi, P.O. Box 1001, Carpinteria, Calif. 93013

Filed June 19, 1974, Ser. No. 480,733
Int. Cl. A63b *39/00, 43/02*
U.S. Cl. 273—58 D **11 Claims**



1. A throwing and spinning toy comprising:

a plurality of elongated members, each having a substantially low friction configuration, connected to form a three-dimensional structure;

each member being connected to four of the other members and being spaced from the remainder of said members;

two of the four members being connected to said each member being connected to each other and the other two of the four members being connected to said each member being connected to each other;

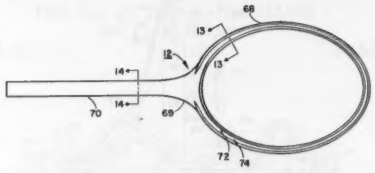
at each connection of said members there being a maximum of two members being joined; and

the spacing between the members being great enough so that friction on the toy is insignificant when the toy is moved freely through the air.

3,889,951
LAMINATED REINFORCING FACING FOR A GAME RACKET

William H. Schaefer, and Richard E. Bender, both of San Diego, Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 241,176, April 5, 1972, Pat. No. 3,840,230. This application Feb. 15, 1973, Ser. No. 332,956
Int. Cl.[2] A63B *49/10*
U.S. Cl. 273—73 F 15 Claims



1. A reinforcing facing for a game racket, adapted to be bonded to the face of a racket shell; said facing having a closed loop frame area, a throat area and an elongated handle area extending away from said throat area, all of said head frame, throat and handle area lying substantially along a single plane; said facing comprising:

a body portion having the configuration of said facing and having a first surface of predetermined configuration adapted to engage a correspondingly shaped. surface of the racket face to which the facing is to be bonded;

said body portion having a substantially U -shaped cross-section configuration in the frame area of said facing, modified through the throat area to a substantially rectangular cross-section in the handle area;

said body portion comprising a plurality of substantially parallel high Young's modulus fibers in a synthetic resin matrix;

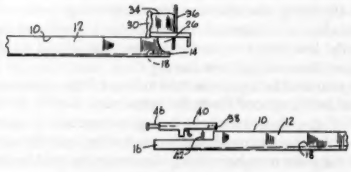
said fibers in said body portion comprising a continuous tow extending up through the handle area, through the throat area, aroung the frame area, back through the throat area and back down the handle area;

at least one layer of cloth made up of high Young's modulus fibers in a synthetic resin matrix bonded to a second surface of said body portion opposite to said first surface; said cloth having from 0 to about 50 percent woof fibers and from 50 to 100 percent warp fibers.

3,889,952
GAME WITH PUCK LAUNCHING MEANS AND GOAL TENDER

James T. Shiga, P.O. Box 648, Rexdale, Ontario, Canada (06880)

Filed Oct. 19, 1973, Ser. No. 408,120
Int. Cl. A63f *3/00*
U.S. Cl. 273—121 R 1 Claim



1. A game comprising:

a hollow rectangular game board having flat horizontal top and bottom surfaces and an inner chamber with a bottom which slopes downward from one end to the other, said other end having a vertical opening, said top surface at said one end having off center top horizontal openings whereby when a puck falls through one of the horizontal openings it slides by gravity toward the other end in the chamber for subsequent removal at the vertical opening;

a horizontal hollow platform having a vertically disposed opening therein being centrally secured to said top surface at said one end and extending rearwardly therefrom such that a puck sliding along said top surface will enter said vertical opening in the platform;

a movable simulated goal tender disposed at the one end between the horizontal openings in front of said vertical opening in a substantially puck blocking relationship;

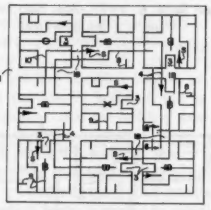
a puck; and

manually actuated puck launching means disposed at the other end.

3,889,953
SOLITAIRE TIC-TAC-TOE GAME

James A. Grasham, P.O. Box 207, Eugene, Oreg. 97401

Filed July 28, 1972, Ser. No. 276,253
Int. Cl. A63f *3/00*
U.S. Cl. 273—130 B 20 Claims



5. A game device comprising:

a plurality of counters;

a game board having discrete areas thereon, said board areas for receiving said counters;

means for uniquely orienting said counters in said board areas;

said counters having first markings thereon, said first markings being in the form of first, second, and third indicia, each counter having only one of said indicia thereon;

said counters having second markings thereon, said second markings being in the form of pathways, the counters located in said board areas having certain pathways on different counters in communication.

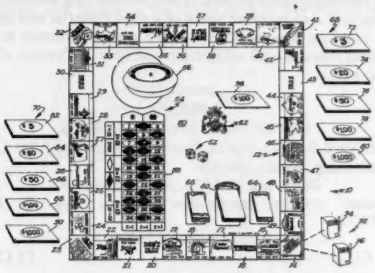
3,889,954
BOARD GAME APPARATUS

Jack T. Malisow, Minneapolis, Minn., assignor to Research & Development, Minneapolis, Minn.

Filed Feb. 12, 1973, Ser. No. 331,605
Int. Cl. A63f *3/00*
U.S. Cl. 273—134 C 8 Claims

1. Game board apparatus, comprising in combination: a game board having marked locations constituting a path of progression about the board, with at least some of the locations being possessory locations and at least some of the locations being nonpossessory, reward/penalty locations; means for indicating ownership of the possessory locations; means for determining the reward/penalty of the reward/penalty locations; at least two playing pieces with one playing piece being associated with each player of the game; chance taking apparatus for determining the movement of the playing piece of each player along the path of progression on the board, at least a portion of the possessory locations comprising betting possessory locations, at least one additional different known chance taking apparatus, one of said chance taking apparatus being selectable by a player whose playing piece comes to rest on a betting possessory location possessed by an opposing

player for determining an occupancy payment due said opposing player by betting prior to movement from the betting possessory location in a game of chance using only said one selected chance taking apparatus; means for indicating a minimum and maximum bet required for determining said

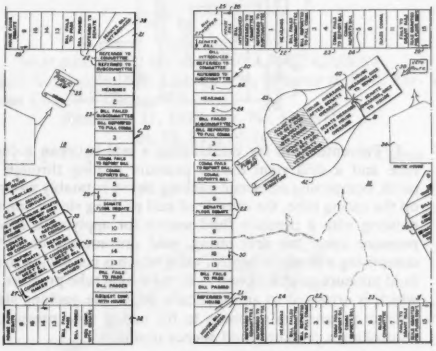


occupancy payments due to an owner of a betting possessory location; and a medium of payment for satisfying certain obligations or benefits from the means for determining the reward/penalty and for satisfying occupancy payments for possessory locations.

3,889,955
LEGISLATIVE BOARD GAME APPARATUS

Verlon Welch, 7709 Arlen St., Annandale, Va. 22003, and Dreama B. Hinton, 4903 Southland Ave., Alexandria, Va. 22312

Filed July 5, 1974, Ser. No. 486,253
Int. Cl. A63f *3/00*
U.S. Cl. 273—134 D **10 Claims**



6. A game adapted to increase appreciation and knowledge of procedural steps for enacting a public law, said game comprising in combination:

a. a game board having spaces disposed thereon,

b. a first plurality of said spaces defining alternative legislative playing paths including a common starting space,

c. a preselected number of said first plurality of spaces having legends thereon representing sequential legislative steps and the remaining spaces being interspersed among said legended spaces and including indicia representing certain alternative parliamentary rulings,

d. a second plurality of said spaces defining alternative conference paths leading from said alternative legislative paths to an executive review space designated "White House,"

e. a third plurality of said spaces extending from said executive review space and defining alternative veto overriding

f. a plurality of playing pieces adapted to indicate specific bills corresponding to each of the several players, and paths terminating in a space designated "Public Law,"

g. means for determining by chance the path and extent of movement of each playing piece.

3,889,956
ELECTRONIC AMUSEMENT MACHINE

Trevor William Castle, 10 Thornton St., Eltham, Victoria, Australia (3095)

Filed Jan. 16, 1973, Ser. No. 324,212
Int. Cl. A63f *1/00*
U.S. Cl. 273—138 A **14 Claims**

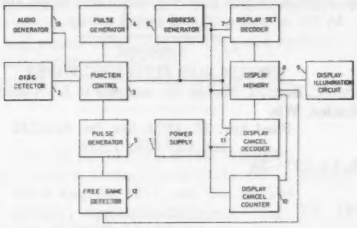
1. An electronically controlled amusement apparatus adapted to play card games comprising:

a face having a number of electronically controlled lamps producing a number of displays each bearing a card representation and being capable of illumination to provide a visual card representation,

circuit driver means connected to each of said lamps for effecting illumination and extinguishment of the connected lamp,

means for connecting each of said circuit driver means to memory so that, when a bit in said memory is in said set condition, at least one driver circuit is electronically operated to cause display of a card representation associated with that bit,

said memory having a plurality of storage bits, each bit corresponding to one of said lamps of said card representations and each bit having at least a set condition associated with display of the corresponding card representation and a reset condition associated with an extinguished display of the corresponding card representation,



manually operable first means for player operation to electronically set following manual operation thereof, one at a time, a plurality of bits in said memory,

means connected to said memory and to said first means for setting, one at a time and at least pseudorandomly, a plurality of said bits following manual operation of said first means,

a single player operated cancel means capable of being manually operable for a predetermined time immediately following setting of each bit for operation to cause that bit to return to its reset condition, and

further circuit means connected to said memory and said cancel means for causing a set bit to return to its reset condition and said setting means to electronically set another bit following manual operation of said cancel switch means within said predetermined time,

means for counting the number of manual operations of said single cancel means and disabling said further circuit means when the count reaches a preset plurality, and

means for preventing setting of further memory bits after a predetermined number thereof have been set.

3,889,957
GOLF BALL TARGET

Robert Klabacka, Madison, Wis., assignor to Diesel Truck Drivers Training School Inc., Sun Prairie, Wis.

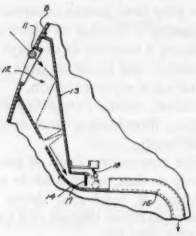
Filed Mar. 29, 1974, Ser. No. 456,231
Int. Cl. A63b *69/36, 63/00*
U.S. Cl. 273—182 R **3 Claims**

1. A target device for receiving flying golf balls, comprising:

a hollow, spherical target having a plurality of target holes

disposed in spaced apart relationship on the outer surface of said target, said target holes adapted to receive a flying golf ball;

a plurality of traps within said target each communicating with one of said target holes and having walls which converge downwardly from one of said target holes toward the interior of said target so that a flying golf ball entering one of said target holes will be deflected downwardly within said trap;



a ball collection point connected to an outlet of each of said traps to receive golf balls passing through said traps;

switch means mounted adjacent the outlet of each of said traps and actuated by a golf ball passing through the outlet; and

an electrical signal disposed within said target and actuated by the actuation of said switch means.

3,889,958

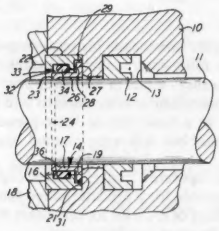
PISTON ROD FLOATING WIPER

Milton C. Bennett, Moline, Ill., assignor to J. I. Case Company, Racine, Wis.

Filed Apr. 15, 1974, Ser. No. 461,252

Int. Cl.[2] F16J *15/16*

U.S. Cl. 277—24 **5 Claims**



1. A rod floating wiper assembly comprising a housing member, a piston rod axially movably disposed in said housing member, said housing member having an annular opening encircling said piston rod, a first endless ring member fixedly disposed in said annular opening and being in snug contact with said housing member and encircling said piston rod and having a radially inner circumferential surface radially spaced from said piston rod, a second endless ring member disposed in said annular opening and being nested with said first ring member and being radially spaced from any contact with said first ring member and having a radially outer circumferential surface axially aligned with and radially spaced from said radially inner circumferential surface for radial movement of said second ring member toward and away from said first ring member, one of said ring members having an annular groove faced toward the other of said ring members, an elastomeric O-ring disposed in said annular groove between said ring members and being snug with each thereof for precluding the passage of dirt between and beyond said ring members while permitting relative radial movement therebetween, said second ring member having an inner circumferential surface extending along at least a part of the total axial length of said second rig member and disposed in endless snug contact with said piston rod for precluding the passage of dirt past said inner circumferential surface of said second ring member, and said second ring member being of a rigid material and spaced from said first ring member to move with and remain in endless snug contact with said piston rod upon deflection of said piston rod.

3,889,959

EARTH DRILLING APPARATUS

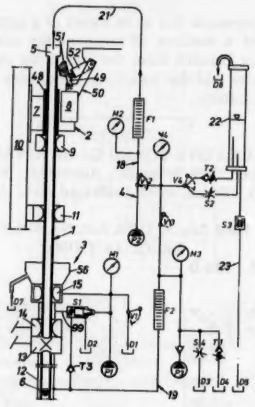
Jan Edvard Persson, Nacka, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Aug. 2, 1973, Ser. No. 384,953

Claims priority, application Sweden, Aug. 7, 1972, 10239/72

Int. Cl. E21b *33/06*

U.S. Cl. 277—27 **12 Claims**



1. Preventer unit for establishing a seal between a casing tube and a drill stem during pressure drilling through the earth, comprising an elastic packing sleeve rotatably mounted on the casing tube, the outside of said packing sleeve communicating with a pressure fluid source for applying a contact pressure upon the drill string, said preventer unit further comprising a pressure control valve which is connected to said fluid pressure source as well as to the casing tube pressure and which is arranged to automatically adapt the packing sleeve contact pressure in response to the casing tube pressure by controlling a pressure fluid source drainage.

3,889,960

COOLING SEAL

Winfred J. Wiese, Whittier, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 295,082, Oct. 4, 1972, Pat. No. 3,806,135.

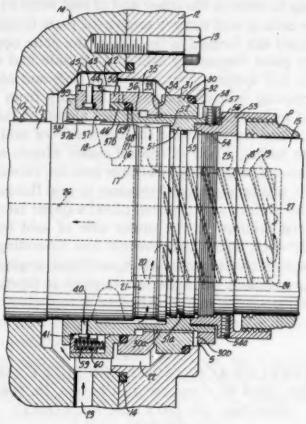
This application Nov. 2, 1973, Ser. No. 412,378

Int. Cl. F16j *15/34*

U.S. Cl. 277—81 **7 Claims**

1. A mechanical seal assembly for use in a seal chamber in a housing having a rotatable shaft in said chamber, comprising: an elongated sleeve adapted to be disposed on said shaft for rotation therewith, a first seal ring disposed about said sleeve and connected thereto for rotation therewith, a second seal ring disposed about said shaft and non-rotatably fixed to said housing, said seal rings having opposed radial seal faces adapted for cooperative sealing and rotative coengagement, spring means associated with one of said seal rings for biasing the latter towards the other of said seal rings, said sleeve having means defining an internal, annular, longitudinally

extending space, and fluid passageway means communicating said chamber with said space, wherein said means defining said space comprise annular recess means in the inside wall of said sleeve and a radially opposite portion of the surface of said shaft, and wherein said fluid passageway means comprise elongated slot means in the inside wall of said sleeve at one



end of said space and radially opposite portions of the surface of said shaft.

3,889,961

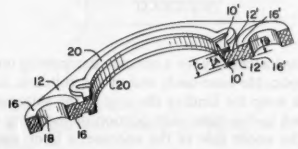
MOLDED TYPE HEAT INSULATING GASKET

Robert G. Farnam, New Lisbon, Wis., assignor to F. D. Farnam Co., New Lisbon, Wis.

Filed Jan. 21, 1974, Ser. No. 434,871

Int. Cl. F16j *15/10*

U.S. Cl. 277—166 **4 Claims**



1. A heat insulating gasket for use between mating flanges of an internal combustion engine conduit or the like, said gasket comprising a unitary molded core member of insulating material having a body portion of given thickness, having bolt holes and a fluid passageway therethrough, bosses coaxial with said bolt holes projecting from the surfaces of said body portion to a greater thickness than the thickness of said body portion, die-cut sheet packing material on said body portion of said core surrounding said fluid passageway projecting further from said body portion than said bosses project, the total plan area of said packing material being less than 33⅓ percent of the plan area of the core member, whereby when the gasket structure is clamped between said mating flanges, said packing material will be compressed to the level of said bosses forming a seal between said flanges and substantial air spaces will be provided between said flanges and said core member for heat insulating purposes.

3,889,962

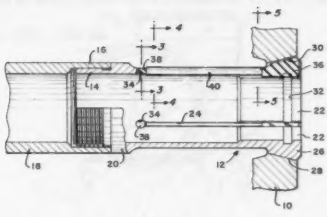
SEALS FOR COLLETS

Hubert J. Parsons, Horseheads, N.Y., assignor to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Jan. 8, 1974, Ser. No. 431,708

Int. Cl. B23b *31/20*

U.S. Cl. 279—46 **9 Claims**



1. A machine tool collet including:

a. a cylindrical body having a longitudinal axis,

b. a collet head at the outer end of said body having a front face,

c. a plurality of slots in said body extending rearwardly from said front face and thereby forming a plurality of collet fingers,

d. seal means positioned in said slots and extending over a major portion of the length of said slots,

e. said seal means comprising an elongated resiliently deformable length of tubing, and

f. said tubing is adhesively secured in said slots.

3,889,963

CHAIR PROVIDED WITH WHEELS

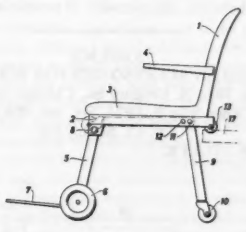
Sven-Olof Brattgard, Storangsgatan 32, Goteborg, Sweden

Filed Aug. 14, 1973, Ser. No. 388,184

Claims priority, application Sweden, Aug. 17, 1972, 10666/72; July 27, 1973, 73104184

Int. Cl. B62b *7/06*

U.S. Cl. 280—36 B **1 Claim**

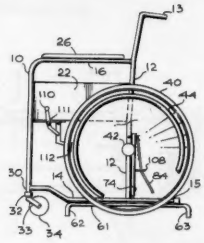


1. A chair provided with wheels comprising a seat, a frame with an upper part, a front wheel assembly and a rear wheel assembly connected to said upper part, said rear wheel assembly being displaceable from its normal position to one extending from the rear end of the underside of said frame upper part, so that the underside of the same is free from extending parts and is moveable onto an elevated supporting base, while at the same time being supported at ground level by the front wheel assembly, said rear wheel assembly being adjustable to the location of a support for the back connected to the sitting part of the seat.

3,889,964
BRAKE STAND FOR WHEELCHAIRS

Floyd B. Pitts, Jr., 1949 Rimpau Blvd., Los Angeles, Calif. 90016

Filed Nov. 19, 1973, Ser. No. 416,971
Int. Cl. B60t *1/14*
U.S. Cl. 280—43.24 7 Claims



1. A brake attachment for a wheel chair resting on a surface, said wheel chair of the type having a frame and seat and a pair of main wheels and a pair of forward wheels, said brake attachment means coupled to the frame of the wheel chair and adjustably moveable with respect thereto, said brake attachment means comprising:

a frame structure having:

a pair of transversely spaced longitudinal members, each having a forward end and a rear end spaced a preselected longitudinal distance from said forward end;

foot portions coupled to each of said forward ends and said rear ends of said longitudinal members;

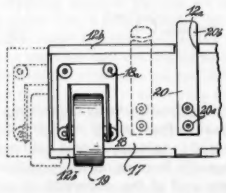
latch means operatively interconnecting said brake attachment means and said wheel chair for selectively securing said brake attachment means to said wheel chair in a plurality of positions relative thereto, and in at least a first of said plurality of positions said foot portions are free of engagement with the surface upon which said wheel chair rests to allow said main wheels and said forward wheels to engage said surface to allow movement of said wheel chair thereon, and in a second of said plurality positions said foot portions engage the surface to lift at least said main wheels free of engagement with the surface to prevent movement of said wheel chair thereon;

trigger means operatively engaging said latch means to allow selective movement of said brake attachment means between said plurality of positions thereof.

3,889,965
WHEELED ACCESSORIES FOR SUITCASES

Wolf Zeitlin, 2814 N. Gregory St., Chicago, Ill. 60625

Filed May 9, 1974, Ser. No. 468,434
Int. Cl. B62b *1/04*
U.S. Cl. 280—47.13 R 1 Claim

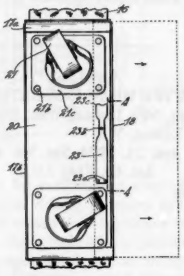


1. Wheeled support means for luggage comprising a pair of wheeled assemblies which are removably attachable to said luggage in spaced relationship to each other when attached to said luggage, each of said wheeled assemblies comprising a luggage-bearing channel plate to be fitted transversely on one side of said luggage adjacent the end of said side, a first slot extending lengthwise of said plate, the open side of said first slot facing the side of said plate opposite the side of said plate contacting said luggage side, the said first slot having opposing grooves extending laterally from the open side to form recesses, a strap slidably inserted into said recesses to hold said plate to said luggage side, a terminal buckle keeper on one end of said strap to receive the other end of said strap to lockingly couple the ends of said strap to secure the plate to said luggage side, a second slot formed in the side of the plate opposite the side of the plate contacting said luggage side and extending parallel to, but spaced from, said first slot, and second slot having opposing grooves extending laterally from the open side of said second slot to form recesses along the sides of said second slot and flanges along the open side of said plate, an insert plate having a pair of spaced caster wheels secured to one side thereof removably insertable into the recesses of said second slot, a pair of opposed recesses in said flanges midway between the ends of said channel plate, a finger latch of resilient material secured to the under side of said insert plate midway between said caster wheels and extending laterally beyond the side of said insert plate, said latch engaging one of said flange recesses when the insert plate is fitted into said second slot to secure said insert plate in said channel plate.

3,889,966
WHEELED ACCESSORY FOR SUIT CASES

Wolf Zeitlin, 2814 W. Gregory St., Chicago, Ill. 60625

Filed Nov. 26, 1973, Ser. No. 418,810
Int. Cl. B62b *1/10*
U.S. Cl. 280—47.13 R 5 Claims



1. A wheeled accessory for a suitcase comprising one accessory unit applicable near each end of the suitcase, each unit comprising a strap for binding the unit to the suitcase, a base plate attached to the outer side portion of the strap which is fitted over the under side of the suitcase, a liner attached to the inner side of said portion of said strap thereby clamping said strap portion between the base plate and the liner, pendent wheel means slidably inserted onto each base plate, means on said base plate to receive said wheel means in sliding engagement and resilient means to lock said wheel means on each base plate.

3,889,967
PATIO SERVING CART

Elmer E. Sauer, 1520 S. Ash, Denver, Colo. 80222

Filed Mar. 4, 1974, Ser. No. 447,545
Int. Cl. B62b *3/02*
U.S. Cl. 280—47.35 1 Claim

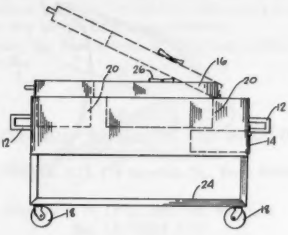
1. A serving cart comprising:

a rectangular shaped unit having a horizontal top with first and second vertical wells disposed side by side and extending downward therein, said unit having parallel vertical ends and parallel vertical sides extending at right

angles to the ends, said unit having a horizontal bottom supported on wheels;

first and second pairs of horizontally spaced handles extending at right angles to said ends, each pair being secured to and extending outwardly from a corresponding end;

horizontal drawers disposed slidably in said ends;



a single horizontal cover hingedly secured at one end to the top of the unit adjacent to but inward from one of the unit ends, said cover extending over the top of the unit to cover the wells and having a horizontally disposed manually operable vent; and

first and second drop leaf table tops, each table top being hingedly secured to a corresponding side of the unit adjacent the cover, each table top, when horizontally extended being level with the top of the unit.

3,889,968

MOTOR VEHICLE, ESPECIALLY PASSENGER MOTOR VEHICLE

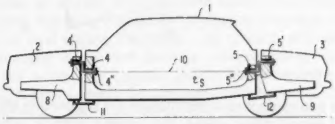
Karl Wilfert, Gerlingen-Waldstadt, and Bela Barenyi, Maichingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Mar. 4, 1974, Ser. No. 447,816

Claims priority, application Germany, Mar. 3, 1973, 2310710

Int. Cl. B62d *31/00*

U.S. Cl. 280—111 **65 Claims**



1. A vehicle comprising:

front axle aggregate means belonging to a front vehicle section,

rear axle aggregate means belonging to a rear vehicle section, said rear axle aggregate means being spaced from the front axle aggregate means in the vehicle longitudinal direction,

vehicle body means including a passenger space,

at least one crank means pivotally connecting the vehicle body means to one of said axle aggregate means; said crank means including a first pivot pin means coordinated to said one axle aggregate means and a second pivot pin means coordinated to the vehicle body means, said first and second pivot pin means being at respective different vertical heights and extending substantially in the vehicle longitudinal direction,

and at least one coupling rod means which is pivotally connected at said vehicle body means and at said one of said axle aggregate means, said coupling rod means extending in the vehicle longitudinal direction and being pivotally connected at the vehicle body means and said one of said axle aggregate means at respective pivot points disposed below the respective first and second pivot pin means.

3,889,969

LINEAR TENSION DAMPING DEVICE

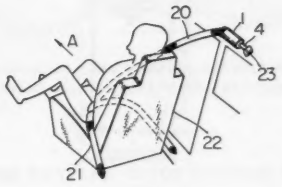
Syuichi Otani, Tokyo, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed Feb. 16, 1973, Ser. No. 333,348

Claims priority, application Japan, Feb. 17, 1972, 47-19697

Int. Cl. B60r *21/10*

U.S. Cl. 280—150 SB **1 Claim**



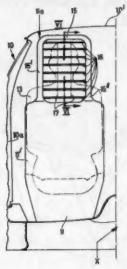
1. In a motor vehicle provided with a restraint system having a lap belt extending over and across a seat portion of the seat; a shoulder strap having one end anchored to the lap belt and having another end; a linear tension damping device comprising an elongate cylinder with an inner wall defining a bore, said elongate cylinder being closed at one end by an end plug which is anchored to said another end of said shoulder strap and said cylinder being reduced in diameter at an opposite end to provide a reduced diameter annular projection; a first piston axially slidable in said cylinder and axially dividing said bore into first and second compartments; a piston rod secured at one end to said first piston and extending from the same through said first compartment and through said reduced diameter annular projection externally of said bore, said piston rod terminating and being pivotally secured to a reinforced inner body portion of the vehicle; a second piston slidable in said second compartment and axially dividing said second compartment to provide at a side thereof opposing to said

first piston a first subcompartment and at the opposite side of said second piston a second subcompartment; an annular seal member sealingly engaging with said wall of said elongate cylinder defining said bore and sealingly and slidably engaging with said piston rod to close said first compartment; said first piston having a plurality of axial passages extending therethrough; an incompressible liquid filling said first compartment said passages of said first piston and said first subcompartment; a compressed gas filling said second subcompartment; a valve disc having an aperture and disposed in said first subcompartment, said valve disc seating on an axial end of said first piston which faces said first subcompartment to close said passages of said first piston; an adjustor extending through said aperture of said valve disc and threadedly engaging into said piston from said axial end of said first piston to bias said valve against said axial end of said piston; and at least one shearing pin extending through said reduced diameter annular projection and through said piston rod to lock movement of said piston rod relative to said elongate cylinder, said shearing pin being constructed such that relative axial movement of said piston rod relative to said cylinder is prevented unless a predetermined magnitude of tension is applied on said lap belt.

3,889,970
VEHICLE BODY WITH OCCUPANT HEAD-PROTECTIVE CURTAIN

Karl Astheimer, Bischofsheim, and Karl Hug, Niedernhausen, both of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 25, 1974, Ser. No. 445,135
Claims priority, application Germany, Mar. 7, 1973, 2311160
Int. Cl. B60r *21/02*
U.S. Cl. 280—150 B **3 Claims**



1. In a vehicle body, an occupant head restraint comprising: a plurality of flat flexible straps having elongated configurations with predetermined widths, each of the straps having opposite ends formed into loops; and

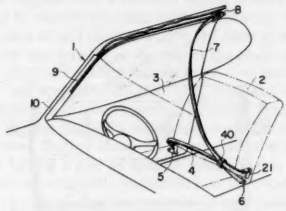
attachment members mounted on the vehicle body and associated with the opposite ends of the straps, the attachment members having portions received within the loops of the straps to position the straps in a spaced relationship extending parallel to each other adjacent the head of a seated occupant of the vehicle body, and the attachment portions normally maintaining the planes of the straps in alignment with the line of sight of the occupant so as not to impair the occupant's vision and permitting the straps to rotate into a common plane as the occupant's head engages the straps so that this engagement is with the total width of the straps in an effective restraining manner.

3,889,971
SAFETY BELT APPARATUS

Kenichi Kazaoka, Nagoya; Kimiharu Hirose, Obu; Yasuo Takeshita, Toyota; Hisao Matsumoto, Chita, and Kazuo Okamoto, Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Aisin Seiki Kabushiki Kaisha, Kariya, both of, Japan

Filed Dec. 22, 1972, Ser. No. 317,699
Claims priority, application Japan, Dec. 24, 1971, 47-1409
Int. Cl. B60r *21/02*
U.S. Cl. 280—150 SB **3 Claims**

1. A seat belt device for a vehicle having at least one door, a front pillar, as well as floor and roof portions, for securing a passenger to a seat in the vehicle, the device comprising: a waist belt anchored at one end to said door, and at the other end to a portion of the vehicle opposed to said door on one of said seat and said floor portion; a shoulder belt operatively connected with said waist belt, and being anchored at one end to a side of said roof portion above said door, and at the other end to one of said seat and said floor portion; retracting means secured to at least one of said belts to vary the length thereof, to thereby selectively restrain and release the passenger to and from said seat; a guide track supported at a portion of said side of the roof portion and extending along a curvature of said side up to the lowermost end of said front pillar; guide means slidably mounted on said track and engageable with said shoulder belt for guiding the movement of the latter; and driving means operatively connected to said guide means and being actuatable for sliding the same in response to ingress and egress motions of the passenger into and out of the vehicle; wherein said guide means includes a cable in said track for connecting said driving means with said guide means; and

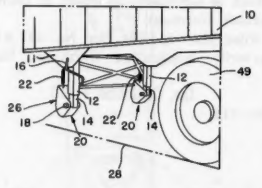


wherein the latter includes a pair of first and second guide members, said first guide member being proximate to said front pillar and being fastened to said cable, and said second guide member being freely slidable on said cable so that forward movement of the latter causes said second guide member to follow said first guide member in spaced relation therewith.

3,889,972
LANDING GEAR FOR SEMI-TRAILER

Elmer S. Bredt, 1722 E. Mayamensing Ave., Philadelphia, Pa. 19148

Filed Apr. 16, 1973, Ser. No. 351,964
Int. Cl. B60s *9/04*
U.S. Cl. 280—150.5 **9 Claims**



1. In a landing gear construction for supporting the forward end of semi-trailers above the ground surface, wherein the semi-trailer construction carries an axle at an initial height, the combination of

A. a landing pad rotatively connected to the axle and having clockwise and counter-clockwise movement about the axle,

1 said landing pad including a front face, a rear face and a curved cam surface extending from the front face,

2. said landing pad further including a flat support pad in spaced relation from the axle, said flat support pad being interconnected between the rear face and the curved cam surface;

B. spring means biasing between a portion of the semi-trailer construction and a portion of the landing pad,

1. said spring means biasing the landing pad about the axle to an upper position wherein the landing pad is carried above the said ground surface and the flat support pad is positioned in angular relation to the ground surface; and

C. means to vary the height of the axle relative to the semi-trailer construction.

6. In a method of supporting the front end of a semi-trailer construction which is equipped with a landing gear axle and a jack to raise and lower the axle, the steps of

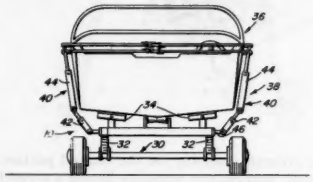
A. connecting a motor vehicle to the semi-trailer to support the front end of the semi-trailer;
B. affixing a landing pad having a cam surface and a flat support surface to the axle;
C. lowering the jack until the cam surface contacts the ground;
D. moving the semi-trailer in the direction of the flat support surface until the flat surface rests upon the groun to support the weight of the semi-trailer;
E. removing the motor vehicle from association with the semi-trailer.

3,889,973

OPPOSITE SIDE CENTERING AND HOLD-DOWN TRAILER UPRIGHTS

Richard L. Fehseke, 621 1/2 Seventh St., Fort Madison, Iowa 52627

Filed Nov. 8, 1973, Ser. No. 414,136
Int. Cl. B62d *3/10*
U.S. Cl. 280—179 A **10 Claims**



1. An elongated trailer including opposite side portions extending longitudinally of the trailer, a load centering device for said trailer, said device including a pair of opposite side arm assemblies, each of said arm assemblies including a pair of first and second arm structures including one pair of adjacent ends and means pivotally securing said adjacent ends together for adjustable relative angular displacement of said arm structures about an axis extending transversely of said arm structures, means carried by one end of each arm assembly defining an anchor location for a tension member, a pair of mounting brackets carried by corresponding opposite side portions of said trailer, the other end of each arm assembly being pivotally supported from a corresponding mounting bracket for adjustable angular displacement relative to the mounting bracket about an axis substantially paralleling the first mentioned axis and extending longitudinally of said trailer.

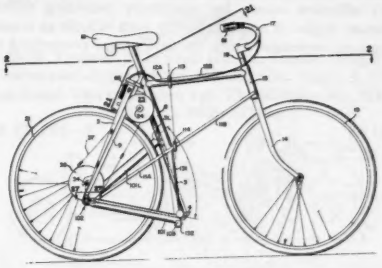
3,889,974

ERGONOMIC DRIVE FOR BICYCLES AND OTHER HUMAN POWERED MACHINES

Charles A. Kallander, 7554 Lynch Rd., Sebastopol, Calif. 95472

Filed Oct. 1, 1973, Ser. No. 402,141
Int. Cl. B62m *1/00*
U.S. Cl. 280—251 **18 Claims**

1. A machine for converting human powered reciprocating leg or arm motion to rotary motion comprising:
a. a frame;
b. a rotatable member mounted for rotation on said frame;
c. a flexible stranded elongated member having a thickness substantially less than its width and having an end connected to said rotatable member and spirally wound upon itself on said rotatable member;
d. a plurality of non-compressible members of increasing thickness arranged in side by side non-connected relationship and each individually attached to said elongated member along a portion of its length forming a segmented portion of tapering thickness which increase in thickness in proportion to the distance from the end connected to said rotatable member;
e. foot or hand receiving means engaging said elongated member; and



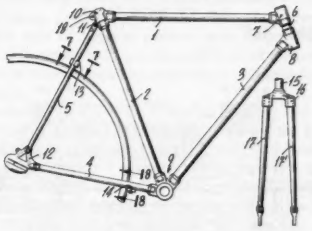
f. means connected to said frame and said rotatable member for rewinding said elongated member upon said rotatable member.

3,889,975

FRAME FOR BICYCLES, MOTOR BICYCLES AND THE LIKE

Lodovico Falconi, Via Ca Pisani, 13, Padova, Italy

Filed Mar. 28, 1974, Ser. No. 455,552
Claims priority, application Italy, Oct. 18, 1973, 41667/73
Int. Cl. B62k *11/02*
U.S. Cl. 280—281 **9 Claims**



1. A frame for bicycles, motor bicycles and the like to which a fork for a front wheel connected to a handle bar as a steering member may be pivoted, and to which a fork for a rear wheel may be made fast, said frame comprising a plurality of angle connecting elements having internal screw threads; a plurality of tubular elements having internal screw threads at each end thereof and having external screw threads at each end thereof threaded in said angle connecting elements internal screw threads in interconnecting the plurality of tubular elements together; and a plurality of inner strengthening elements screw threaded in said plurality of tubular elements internal screw threads.

3,889,976

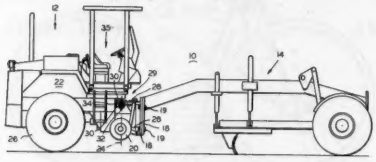
TRACTOR UNIT FOR AN ARTICULATED VEHICLE

Ronald M. Jesswein, Berrien Springs, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Mar. 21, 1974, Ser. No. 453,230
Int. Cl. B60d *1/00*
U.S. Cl. 280—400 **3 Claims**

1. A tractor unit for a vehicle comprising a body portion, a pair of drive wheels supporting the said body portion, a connection portion located at one end of the said body portion and having a pivotal connection about a vertically disposed axis to the body portion, retractable auxiliary wheels on the connection portion for partially supporting the tractor unit

when it is not coupled to an implement unit, means on the said connection portion for detachably connecting an implement unit to the said tractor unit, and thus by virtue of the said pivotal connection forming an articulated vehicle, and continuously effective means for selectively providing different maximum angles of articulation for such vehicle as required for various implement units, the said means comprising stop



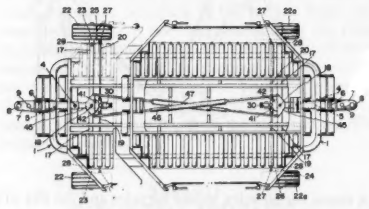
members carried by one of the said portions and arranged to contact rigid abutments on the other said portion to limit the pivotal movement between the said portions, means for adjusting the said stop members to different positions whereby to limit the said pivotal movement to different predetermined angles from the straight ahead position, and each said stop member comprising a rigid structure detachably but rigidly secured to the said one portion.

3,889,977

TRAILERS

Yoshiharu Nakawaki, Osaka, Japan, assignor to Kabushiki Kaisha Suehiro Sharyo Seisakusho, Osaka, Japan

Filed Dec. 7, 1973, Ser. No. 423,374
Int. Cl. B62d *53/00*
U.S. Cl. 280—408 **4 Claims**



1. A trailer comprising, a frame, couplers connected rotatably in a horizontal plane to said frame, swingable members connected rotatably in a horizontal plane to said couplers respectively, axles supported by said swingable members, guide means fixed to said axles respectively and having arcuate guide surfaces, control means provided with said swingable members and each having a guide roller engaging resiliently with said arcuate guide surface to control the rotation of said couplers, and adjusting screws provided with said control means to adjust a force applied to said guide rollers.

3,889,978

REMOVABLE GOOSENECK HITCH

Jerry Albert Kann, Rte. 2, Box 470, Roswell, N. Mex. 88201

Filed May 31, 1974, Ser. No. 474,906
Int. Cl. B62d *53/04*
U.S. Cl. 280—415 B **3 Claims**

1. Hitch means for interconnection of a towed vehicle and a towing vehicle comprising:

forwardly projecting tongue means on the towed vehicle, said tongue means having a first socket member thereon;

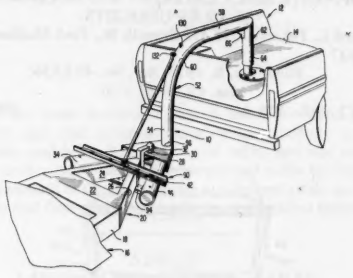
means securing a vertically extending second ball member on the towing vehicle;

a pair of hitch body portion arms, each having a forward end and being adjacent to one another at said forward ends;

mounting plate means fixedly secured over said forward ends of said body portion arms, the mounting plate means having a vertically extending first ball member thereon;

clamp means extending across said body portion arms and said tongue means and clampingly engaged thereagainst, the first socket member being engaged over the first ball member;

a gooseneck having a first upward portion extending from the mounting plate means and a second forwardly extending portion;



a vertical column assembly on the second portion of the gooseneck, said column assembly having a second socket member thereon;

the second socket member being engaged with the second ball member;

the tie rod means extending between the gooseneck and the clamp means;

the body portion arms having a series of substantially vertical openings therein;

the clamp means comprising upper and lower cross bars with a series of spaced holes formed therein; and

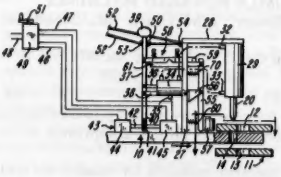
changeable fasteners extending through the holes in the upper cross bar and the openings in the body portion arms, and through aligned holes in the upper and lower cross bars adjacent the tongue means.

3,889,979

AUTOMATIC HITCHING DEVICE

Gregory E. Schmiesing, R.R. No. 1, New Bremen, Ohio 43107

Filed Nov. 21, 1973, Ser. No. 417,820
Int. Cl. B60d *1/10*
U.S. Cl. 280—446 R **23 Claims**



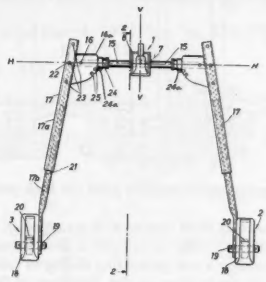
1. A hitch mechanism for use in the releasable connection of one mobile unit to another comprising coupling means in connection with said one mobile unit having at least two positions of adjustment in one of which said coupling means is adapted to positively engage a portion of the other of said mobile units so that movement of one unit will induce the movement of the other, means for effecting a powered operation of said coupling means, and control means for said pow-

ered operating means including triggering means, remote from said coupling means, operable to induce a selected position of adjustment of said coupling means.

3,889,980
THREE-POINT ATTACHMENT DEVICE PARTICULARLY FOR A TRACTOR

Hubert Geisthoff, Dohmar, Donrath, Germany, assignor to Jean Walterscheid GmbH, Lohmar, Rhineland, Germany

Filed Mar. 13, 1974, Ser. No. 450,876
Claims priority, application Germany, Mar. 13, 1973, 23123800
Int. Cl. B60d *1/16*
U.S. Cl. 280—461 A **18 Claims**

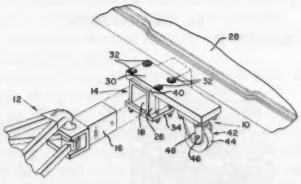


1. A three-point hitch for tractors comprising an upper guide member of variable length including a carrier member, cross bars mounted on said carrier member, a pair of lower guide members below said upper guide member, linkage means pivotally connected to said cross bars for interconnecting said upper and lower guide members, coupling hooks on each of said lower guide members and said carrier member, and said linkage means including means for resiliently supporting said upper guide member in spaced but relatively moveable relationship to said lower guide members.

3,889,981
TRAILER HITCH CONNECTION PROTECTOR

Grimes Westford, 1935 10th Ave., Apt. 303, Oakland, Calif. 94606

Filed Aug. 28, 1974, Ser. No. 501,289
Int. Cl. B60d *1/12*; **B60r** *19/00*
U.S. Cl. 280—507 **5 Claims**



1. Vehicle trailer and trailer hitch protector preventing trailer and trailer hitch near the point of connection from touching the vehicle riding surface comprising:

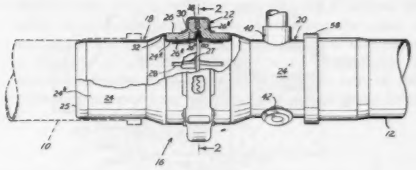
a. a support member secured in the vicinity of the tractor-trailer hitch connection such that said support member does not interfere with the accomplishment of the connection and disconnection of the trailer and trailer hitch; and

b. wheel mounting means rotatably mounted on said support member for a rotation about a vertical axis and including a wheel rotatably mounted about a horizontal axis such that at least a portion of said wheel always extends below the lowest point of the vehicle trailer-trailer hitch connection.

3,889,982
PIPE COUPLER

Harold K. Trunnell, 3520 Knob Hill Ln., Eugene, Oreg. 97405

Continuation-in-part of Ser. No. 231,636, March 3, 1972, abandoned. This application Apr. 23, 1973, Ser. No. 353,593
Int. Cl. B05b *15/00*
U.S. Cl. 285—5 **4 Claims**



1. The combination of

a pair of axially aligned aluminum pipe sections,

a steel tubular member for each pipe section having one end snugly fitted within an end of its associated pipe section and an opposite end protruding outwardly from the pipe section,

a collar member mounted on each tubular member including an annular rim portion concentric with and snugly encompassing the said opposite end of the tubular member and an annular flange portion joined to the rim portion radiating outwardly from an end of said rim portion, said flange portion having a face lying in a plane normal to the axis of the rim portion with torque-transmitting elements presented thereon, said faces of the collar members for the two pipe sections being in oppositely disposed relation,

indent-detent means on each tubular member and its associated collar member mechanically securing the two for the transmission of torque between them, said indent-detent means comprising a plurality of channels provided along the inner surface of the rim portion, said channels extending axially from one end of the rim portion to a location intermediate said one end and the opposite end, and ridges formed in the tubular member fitting within said channels,

each tubular member having a turned over lip at its said opposite end turned over an end of its associated rim portion, the lips of the two tubular members being in oppositely disposed relation, each tubular member further having an annular shoulder formed therein abutting the opposite end of its associated rim portion,

and a clamp encircling the annular flanges of the two collar members detachably locking them together.

3,889,983
ROTARY FLUID JOINT

Ronny G. Freize, Gastonia, N.C., and George R. Ferguson, Clover, S.C., assignors to Duff-Norton Company, Charlotte, N.C.

Filed Apr. 15, 1974, Ser. No. 460,982
Int. Cl. F16l *55/00*
U.S. Cl. 285—13 **9 Claims**

1. A rotary fluid joint comprising

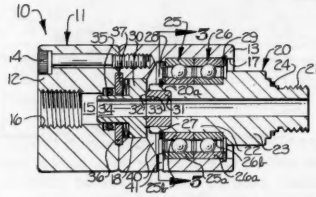
a housing having a passageway therethrough for the flow of pressurized fluid,

a conduit having an inner end portion thereof mounted within said housing in fluid communication with said passageway,

bearing means mounted in said housing and surroundingly engaging said conduit permitting rotational movement of the conduit in said housing,

sealing means positioned within said housing and cooperating with the housing and the inner end portion of said rotatable conduit preventing substantial leakage of pressurized fluid between the conduit and the housing,

substantially flat, circular disk slinger means in said housing mounted on said rotatable conduit against relative movement thereto, said slinger means surroundingly engaging and extending radially outwardly from said conduit for



deflecting radially outwardly from said conduit and away from said bearing means such fluid as may leak past said sealing means to thereby protect the bearing means from contact by the fluid, and

said housing having at least one vent hole in said housing generally aligned with said circular disk slinger means receiving the radially deflected fluid and permitting drainage thereof from the housing.

3,889,984

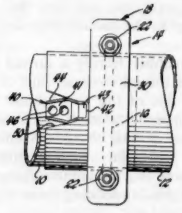
INTEGRAL KEY-CLAMP FOR EXHAUST PIPES

Theodore Lambiris, West Bloomfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 5, 1974, Ser. No. 494,503

Int. Cl. F16l *21/06*

U.S. Cl. 285—27 **4 Claims**



1. A male pipe, female pipe and clamp assembly including, a female pipe having a generally axially directed slot opening through the wall thereof extending from one end thereof, a male pipe having one end telescopically received in said female pipe a first predetermined axial distance, a clamp encircling the female pipe, said clamp including a U-bolt means and a saddle in engagement with said U-bolt means, a key means fixed at one end to said saddle and at its other end to said male pipe, said key means being fixed to said male pipe a second predetermined axial distance inboard of said one end of said male pipe, said key means being slidably received in said slot opening in said female pipe whereby said female pipe is fixed against rotation relative to said male pipe and fastener means associated with said U-bolt means and said saddle for constricting said clamp around said female pipe.

3,889,985

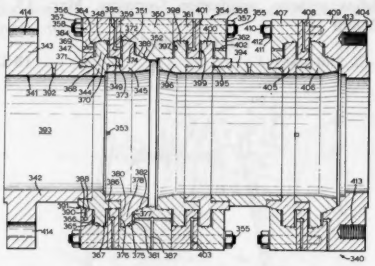
PRESSURE COMPENSATED EXPANSION JOINT

Hans Gartmann, Trenton, N.J., assignor to Swiss Corporation Limited, Willowdale, Canada

Continuation-in-part of Ser. No. 327,456, Jan. 29, 1973, abandoned, which is a continuation of Ser. No. 76,151, Sept. 28, 1970, abandoned. This application Feb. 2, 1973, Ser. No. 328,923

Int. Cl. F16l *27/06*

U.S. Cl. 285—95 **7 Claims**



1. A compensated expansion joint for high pressure piping comprising:

first and second fluid conductors arranged in communication with each other to provide a fluid passage,

means providing a seal permitting sliding of said conductors relative to each other in the direction of flow, but preventing the escape of fluid at the connection between them,

means providing a plurality of expansible chambers each having first and second relatively movable parts,

means providing a direct pressure relationship between said fluid passage and the interior of the chambers,

means fastening the first conductor to said first part of each of said plurality of expansible chambers and means fastening the second conductor to said second part of each of said plurality of expansible chambers so that said conductors are pulled toward each other as the expansible chambers expand.

3,889,986

HOSE COUPLING

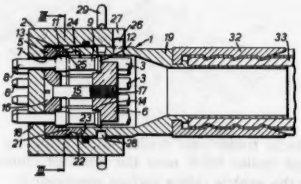
Keith Cheshir, and Peter Farr, both of Cheltenham, England, assignors to Dowty Mining Equipment Limited, Tewkesbury, England

Filed Oct. 2, 1972, Ser. No. 293,947

Claims priority, application United Kingdom, Oct. 1, 1971, 45780/71

Int. Cl. F16l *39/00*

U.S. Cl. 285—137 R **10 Claims**



1. A two part coupling, each part having a plurality of fluid carrying passageways, a plurality of joints each comprising a spigot member and a socket member, the parts being assembled together with each passageway of one part being associated and in alignment with a corresponding passageway of the other part, each passageway in one part carrying a joint member for co-operation with a joint member carried by the corre-

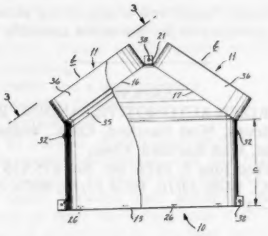
sponding passageway in the other part, hoses secured to one coupling part forming extensions of the fluid carrying passageways therein, said one coupling part comprising a pair of circular flanges secured together in spaced relation and a plurality of recesses formed in each flange, said recesses receiving and retaining the hoses and ferrules attached one to each hose and located between the flanges, said ferrules locating the hoses in a predetermined arrangement about the periphery of said flanges, said joint members of said one part being directly secured to said ferrules so as to be in communication with fluid in said hoses.

3,889,987

SHEET METAL "Y" ADAPTOR FOR DUCTS

Sadik S. Imral, St. Louis, Mo., assignor to Intertherm, Inc., St. Louis, Mo.

Filed Dec. 4, 1974, Ser. No. 529,277
Int. Cl.[2] F16L *41/00*
U.S. Cl. 285—155 **4 Claims**



1. A "Y" adaptor for dividing duct flow, from an entrant opening of larger cross-section to two diverging exit openings of smaller cross-section, comprising

an adaptor body having

two similar body pieces formed from bendable flat sheet metal, each being bounded by edges including

a flow entrant edge whose length equals half the perimeter of such larger opening exclusive of an overlap provision, two side edges extending from the flow entrant edge approximately at right angles, whereby to establish a length along the adaptor body side to a point of divergence,

a pair of symmetrical, concavely arcuate edges, each having a length substantially equal to half the perimeter of such exit opening,

the said arcuate edges extending from said side edges progressively further from the entrant edge and convergingly adjacent to each other to form a tab portion,

each tab portion so formed having a securement provision at its outstanding end,

the body pieces having means adjacent to their side edges to secure them overlappingly,

whereby on bending said body pieces to bring their side edges and tab portions curvedly to a common plane, and on securing the securement provisions of the tab portions to each other and securing the side edges at such plane, an adaptor body is formed having such entrant and exit openings.

3,889,988

PLASTIC ORIFICE INLET EXTENSION MEANS

Michael E. Wendt, Tyler, Tex., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 11, 1974, Ser. No. 432,496
Int. Cl. F16l *33/00*
U.S. Cl. 285—239 **3 Claims**

1. A fan orifice means arranged in a dividing wall comprising:

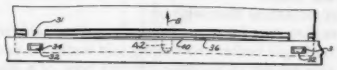
a flange member formed integral with said wall and extending axially therefrom to provide a radial surface circumferentially disposed around said orifice;

an extension member of dissimilar coefficient of expansion than said flange member including a radial wall having a portion telescopically arranged on said radial surface for axially extending said fan orifice;

a lip on one of said members defining a plane perpendicular to the central axis of said orifice engaging the other of said member thereby axially positioning said extension memkber on said flange member;

latching means including tab means spaced circumferentially on one of said members engaging slot means on the other of said members thereby maintaining the other of said members in engagement with said lip in said plane;

a plurality of circumferentially spaced projections extending longitudinally from said plane on one of said members intermediate said latching means being inter-



posed between said lip and the other of said members axially holding a portion of said extension member longitudinally out of said plane a distance sufficient to axially distort said portion of said extension member relative to said plane and place said extension member in axial tension;

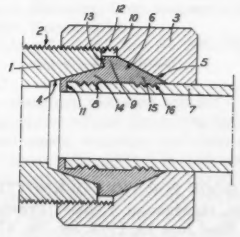
a plurality of cam means spaced circumferentially on one of said members projecting between said radial wall and said radial surface radially spacing a portion of said radial wall from said radial surface a distance sufficient to cause the other portion of said radial wall into forceable contact with said radial surface thereby radially distorting said extension member relative to said flange member and placing said extension member in radial tension whereby said extension member is held in tension radially and axially relative to said flange member to maintain said latching means engaged during expansion of one of the members relative to the other.

3,889,989

PIPE COUPLINGS

Andre Legris, St.-Maur, France, assignor to Societe d'Exploitation des Brevets OCLAUR, Nantes, France

Filed May 2, 1974, Ser. No. 466,269
Claims priority, application France, May 9, 1973, 73.16776; June 8, 1973, 73.21132
Int. Cl. F16l *19/02*
U.S. Cl. 285—341 **10 Claims**



1. In a high pressure coupling comprising:

a first rigid body having a face end and an opposite end and a bore extending from one of said ends to the other, a portion of said bore having a conical surrounding surface which tapers from a first predetermined diameter at said

face end to a smaller diameter at a predetermined distance from said face end and said face end having a face surface extending radially outwardly from and around said bore,

a second rigid body for securing an end portion of a pipe having a plurality of axially spaced, peripherally continuous, peripheral grooves in said end portion to said first rigid body, said second rigid body having a face end for facing said face end of said first rigid body and an opposite end and a bore extending from said face end of said second rigid body to said opposite end thereof, a portion of said last-mentioned bore having a conical surrounding surface which increases from a first diameter substantially equal to the outer diameter of said end portion of said pipe to a second larger diameter in the direction from said opposite end of said second rigid body to said face end of the latter, and

means for securing said second rigid body to said first rigid body including means for forcing one said body toward the other,

the combination therewith of:

a sealing ring for mounting intermediate said first and second rigid bodies and sealing said bodies to said pipe, said ring having an axially extending bore of a diameter substantially equal to said first diameter of said bore of said second rigid body, having first and second, conical and oppositely tapering outer surface portions and an intermediate outer surface portion intermediate said first and second outer surface portions, said latter portions decreasing in diameter from said intermediate surface portion in directions away from the latter and the tapers of said first and second outer portions corresponding respectively to the taper of said conical surrounding surface of said first rigid body and to the taper of said conical surrounding surface of said second rigid body, said intermediate surface portion, at least at the end thereof nearer said first outer surface portion, having a diameter greater than said first predetermined diameter of said conical surrounding surface of said first rigid body and being connected at said end thereof to said first outer surface portion by a sealing lip surface which extends generally radially and around said bore of said ring, said sealing lip surface portion having an axially protruding lip which extends circumferentially of said ring and which is spaced radially outwardly from said first outer surface portion to permit said lip to contact said face surface of said first rigid body prior to any contact of the radially inward remainder of said sealing lip surface portion with said face surface, and said sealing ring being made of a malleable metal to permit the inner surface of said bore thereof to be deformed and fill said grooves in said end portion of said pipe upon forcing of one said body toward the other by said forcing means.

3,889,990

ROTARY HOOK FOR THREAD-KNOTTING MACHINES

Pietro Messa, via Manzoni, 13-Salo' (Brescia), Italy

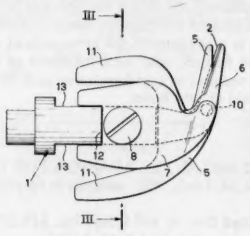
Filed June 13, 1974, Ser. No. 479,266

Claims priority, application Italy, June 15, 1973, 21671 B/73[U]

Int. Cl. B65h *69/04*

U.S. Cl. 289—5 **5 Claims**

1. A rotary hook for thread-knotting machines, characterized in that it comprises, in combination, a stalk, integrally with which a hook portion is formed, there being a depressed portion in said stalk to give seat in succession to a spreader washer, an oscillatory blade with cam-follower rear extensions, a stationary blade and a supporting plate, fastening means being provided to put the whole assembly together.



3,889,991

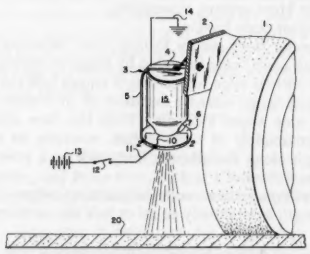
PRESSURIZED AUTOMOTIVE SANDING DEVICE

John Kent Hewitt, West Hartford, Conn., assignor to John Kent Hewitt, West Hartford, Conn.

Filed June 3, 1974, Ser. No. 475,935

Int. Cl. B60b *39/10;* **B61c** *15/10;* **B67b** *7/00*

U.S. Cl. 291—1 **9 Claims**

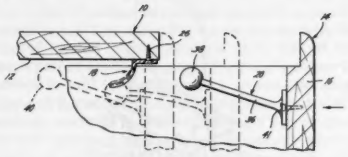


1. A device for increasing the traction between a motor vehicle wheel and a driving surface, comprising; a sealed container containing therein a fluent abrasive ma.erial and means for producing a gas pressure within said sealed container substantially above that of atmospheric pressure; said sealed container having a discharge opening and a plug blocking and sealing said discharge opening; said plug being normally solid and meltable at a predetermined temperature above ambient; means for mounting said sealed container adjacent a wheel of the vehicle and for positioning the opening to direct the abrasive material toward the traction surface in front of the wheel, with respect to the normal driving direction, when the abrasive material is discharged from the opening after melting and removal of said plug; electrical heating means for rapidly heating said plug above said predetermined temperature and melting said plug so as to permit the abrasive material and high pressure gases to be dispensed through said opening when energized; and means for selectively energizing said electrical heating means.

3,889,992
LATCH ASSEMBLY

Billy George Shelton, Hutchins, Tex., assignor to Shur-Lok Manufacturing Co., Inc., Hutchins, Tex.

Filed Nov. 23, 1973, Ser. No. 418,260
Int. Cl.[2] E05C *19/06*
U.S. Cl. 292—87 2 Claims



1. A latch assembly for use with a receptacle member having an access opening, a closure member, and means for supporting the closure member for movement along a predetermined path toward and away from said receptacle on the exterior thereof, said latch assembly releasably preventing more than minimum movement of said closure member from a closed position toward a fully opened position, said latch assembly comprising:

a stop member and a latch member,

said stop member comprising

a base portion, and

a pair of parallel, spaced-apart arcuate, resilient abutment portions depending from said base portion and extending over an arc of from about 45° to about 90°, the space between said abutment portions being greater at their depending ends than adjacent their point of attachment to the base portion, said latch member comprising

a base portion,

a resilient arm extending upwardly at an incline from said base portion, and

a latching lug with a circular surface on the end of said arm,

the diameter of said circular surface being greater than the space between said abutment portions and the width of said arm being less than the space between said abutment portions, and the radius of said circular surface being substantially less than the radius of the arc of the abutment portion whereby upon movement of said closure member toward said receptacle member said circular surface slides on and is cammed downwardly by said abutment portions until it passes the abutment portions, at which point the resiliency of the arm moves it upwardly into the space between the abutment portions, and whereby upon movement of said closure member away from said receptacle member the circular surface engages the arcuate abutment portions to stop such movement of the closure member.

3,889,993
SAFETY LOCK FOR ENCLOSURES

William L. Bright, 0605 S.W. Curry St., Portland, Oreg. 97201

Division of Ser. No. 230,223, Feb. 29, 1972, Pat. No. 3,791,683. This application Dec. 3, 1973, Ser. No. 421,448
Int. Cl. E05c *19/08*
U.S. Cl. 292—251 3 Claims

1. An enclosure with a double safety lock comprising

a. an upright support member,

b. an enclosure,

c. means supporting said enclosure on said support member,

d. said upright support member and enclosure being disposed with portions thereof in vertical overlapping relation,

e. an outwardly extending eye member on said enclosure disposed in an overlapping portion of said support member and enclosure,

f. a slot in said support member arranged to receive said eye member therethrough,

g. said eye member in projecting through said slot being arranged to receive an exterior locking device for providing a first lock connection between said support member and enclosure,

h. and a bolt extending through said support member,

i. said bolt having head engagement with said support member and threaded engagement with said enclosure to provide a second lock connection between said support member and enclosure,

j. the head of said bolt being of non-conventional shape whereby to be capable of rotation only by a special tool and thus non-removable by unauthorized persons,

k. the said support member against which said bolt head is engaged including a protective wall portion peripherally surrounding said bolt head and open at the outer end,

l. said wall portion defining a socket which is at least as deep as the thickness of the bolt head to prevent side engagement of the bolt head by unauthorized persons and which is of greater diameter than said bolt head by unauthorized persons and which is of greater diameter than said bolt head to permit removal of the bolt by a special tool inserted through the open end of the protective wall portion.

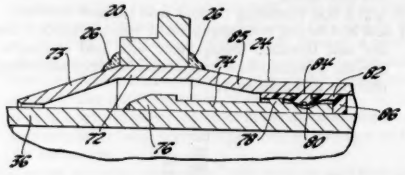
3,889,994
REBOUND CONTROL FOR ENERGY ABSORBER UNIT

Ralph W. Edwards, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 23, 1973, Ser. No. 390,751
Int. Cl. B60r *19/06*
U.S. Cl. 293—85 4 Claims

3. An energy absorbing mounting unit for a bumper assembly of an automotive vehicle comprising inner and outer cylinders, support means mounting said inner cylinder for telescoping movement with respect to said outer cylinder between an extended position and a retracted position, primary control means operatively disposed in said cylinders for absorbing the energy of an impact force imparted to said bumper assembly relatively moving said cylinders from said extended toward said retracted position, motor means operatively disposed in said cylinders for relatively moving said cylinders from said retracted position to said extended position in response to the release of the impact force from said bumper assembly, stop means secured to said inner cylinder for engaging an end portion of said outer cylinder to

establish said extended position of said cylinders, annular elastic sleeve means carried by said stop means and [inner cylinder] operatively disposed between said inner and outer cylinders, said sleeve means having annular [outwardly extending] contact means extending radially outwardly therefrom, said outer cylinder having an inner wall which engages said contact means [for exerting] and exerts a deforming stress deflecting [to] said sleeve means radially inwardly in response to movement of said inner cylinder from said extended position so that the force of restitution of said sleeve means will exert a frictional drag load between said cylinders to reduce the return speed of said inner cylinder when moving from said retracted position to said extended position.

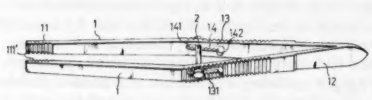


3,889,995

PINCHING TYPE CHOPSTICKS WITH LOCKING MEANS

Chun-Cheng Lin, Tainan, Taiwan, China, assignor to Chuan Chang Enterprise Corporation, Tainan, Taiwan, China

Filed Mar. 15, 1974, Ser. No. 451,539
Int. Cl. B25b *9/02*
U.S. Cl. 294—16 **1 Claim**



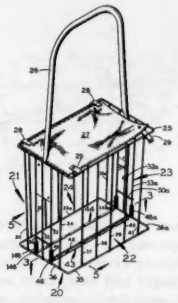
1. Pinching type chopsticks comprising two pinching members, one end of both pinching members being joined together and the other end being open, each pinching member having an inner and an outer face, L-shaped slots in each of said members, said slots having a long leg longitudinally disposed with respect to each respective member and with a short leg transversely disposed at the end of the long leg closest to the joined ends of said members, a pin slidably received within said slots and serving as a selective locking means, said pin having a diameter which is less than the slot width so that said pin can move under the influence of gravity within said slot, said pin having at each of its ends enlarged portions that are outwardly disposed with respect to the outer faces of the respective members, a zigzag formation on each of said outer faces adjacent said long legs of each slot, said formation being engageable with an associated enlarged portion of said pin as said pin is moveable within said long legs of said slots, whereby when the chopsticks are so disposed that said pin lies in said short leg the chopsticks are free for pinching and releasing movement and when the chopsticks are so disposed that said pin lies in said long leg said pin is slidable in a first direction of movement toward said open end of the chopstick to a position in said long slots as determined by the extent of the pinching movement and, at this position, said pin is restrained by the zigzag formation until there is additional pinching movement causing release of said pin and said pin is free to move, in a second direction of movement, toward said short legs.

3,889,996

RETRIEVER

Thomas R. Campbell, 1305 Dewey St., Hollywood, Fla. 33020

Filed Jan. 17, 1974, Ser. No. 434,296
Int. Cl. A47f *13/06*
U.S. Cl. 294—19 A **16 Claims**



1. In a tennis ball pickup and storage device having a receptacle for holding a plurality of balls at one time, said receptacle having a grate-like bottom with substantially parallel, generally horizontal, substantially rigid, elongated members extending across it and spaced apart from each other by substantially less than the width of a tennis ball, the improvement wherein:

one or more of said members in the receptacle bottom is displaceable upwardly with respect to a neighboring member, when applied down against a tennis ball that is engaged between them, so as to increase its spacing from said neighboring member enough to permit said tennis ball to pass up between them into the receptacle; said upwardly displaceable member, after the passage of the tennis ball up into the receptacle, moving down to a position spaced from the neighboring member less than the width of a tennis ball so as to prevent the tennis balls in the receptacle from dropping between them out through the bottom of the receptacle,

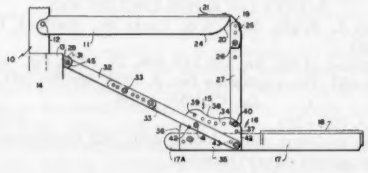
said receptacle having opposite upstanding sides with spaced elongated members extending up from the receptacle bottom, and said one or more upwardly displaceable members being slidable upward along respective upstanding members on opposite sides of the receptacle when applied down against a tennis ball.

3,889,997

AUTOMATICALLY OPERATING TRUCK END GATE STEPS

Clarence E. Schoneck, Box 104, Gull Lake, Canada

Filed Feb. 25, 1974, Ser. No. 445,440
Int. Cl. B60r *3/02*
U.S. Cl. 296—62 **4 Claims**



1. An automatically operating step assembly for use on trucks having an end gate transversely hinged to the rear end of the truck body, by the lower transverse edge of the end

gate, said truck having transverse support means below said end gate hinge; said step assembly moving from a usable position when said end gate is open, to a folded position when said end gate is closed; said step assembly comprising in combination first mounting means securable adjacent the upper edge of the end gate, second mounting means securable to said transverse support means of said truck, a transversely situated step member, plate means on each side of said step member, a pair of hanger straps each pivotally secured by one end thereof to said first mounting means and each by the other end thereof to said plate means on each side of said step member, a pair of anchor straps each pivotally secured by one end thereof to said second mounting means and secured by the other end thereof to said plate means on each side of said step member, said step member including a pair of spaced and parallel side members and a step component spanning the front portions of said side members transversely said plate means on each side of said step member comprising a plate being secured to each side of said side members rearwardly of said step component and extending upwardly therefrom, said plate having a base and an inner end extending upwardly therefrom, and an outer end also extending upwardly from said base, and a top edge extending between said inner and outer ends, said inner end being longer than said outer end, and a plurality of apertures through said plate adjacent to said top edge lying in an arc which is concave relative to said top edge, said other ends of said hanger members being pivotally secured through any one of said apertures.

3,889,998

ADJUSTABLE DENTAL CHAIR

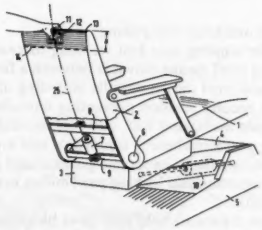
Rolf-Jürgen Welland, Lortzenbach, Furth, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 17, 1973, Ser. No. 407,259

Claims priority, application Germany, Oct. 21, 1972, 2251738; Aug. 2, 1973, 2339267

Int. Cl. A47c *1/04*; A61g *15/00*; D6 *37*

U.S. Cl. 297—217 **6 Claims**



1. An adjustable dental patient's chair, comprising a seat and a back, means for adjusting said seat and said back, manually operated switching means operatively connected with said adjusting means for actuating them, said switching means comprising switch elements and actuating members connected with said switch elements for actuating them, said actuating members having substantially flat key surfaces on their actuating sides and being located in the middle part of the rear side of the upper portion of said back, which part is limited by the upper edge of said back and a limiting line located substantially by the length of 10 to 15 cm width below said upper edge.

3,889,999

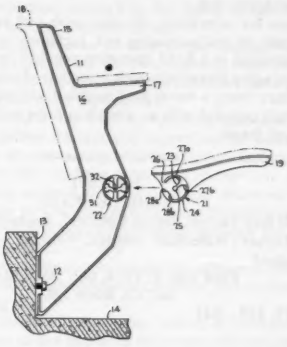
HINGED SEAT BOTTOM CONSTRUCTION

Charles Mackintosh, 3838 Oakwood Ave., Los Angeles, Calif. 90004

Filed May 29, 1974, Ser. No. 474,332

Int. Cl. A47c *1/12*

U.S. Cl. 297—248 **3 Claims**



1. A seat construction, comprising at least one pair of spaced uprights having armrests thereon and a seat back mounted thereto, a seat bottom extending between said uprights and being hingedly interconnected therewith, brackets on opposite sides of said seats, each said bracket having an opening and a pivot arm connected at one end within each said bracket, the free end of each said arm extending toward said bracket openings, a socket member on each said upright hingedly coupled with said brackets for supporting said seat bottom on said uprights, each said socket member including a bearing member having an upwardly open recess therein, cooperating stops on both said brackets and said socket members, said bracket openings permitting said seat bottom to be assembled in place between said uprights with said free ends of said pivot arms received within said recesses, and a first of said stops retaining said seat bottom in a substantial horizontal seating position while a second of said stops retains said seat bottom in a vertically raised position, said free ends of said pivot arms pivoting within said recesses between said positions.

3,890,000

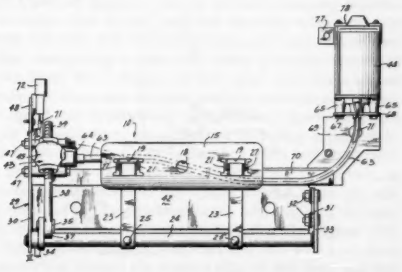
ADJUSTABLE LUMBAR AREA SUPPORT FOR VEHICLE SEATBACKS

Ronald V. Easley, Toledo, Ohio, assignor to Dura Corporation, Southfield, Mich.

Filed Dec. 3, 1973, Ser. No. 421,241

Int. Cl. A47c *3/00*

U.S. Cl. 297—284 **12 Claims**



1. In an adjustable lumbar area support for vehicle seatbacks including a frame carrying a rock shaft and arm means

connecting the shaft to a horizontally elongated lumbar support member in position at the lumbar area of a vehicle seatback in thrusting relation to and behind a flexible backrest of the seatback, the improvement comprising:

a lever arm corotatably fixed on said rock shaft;

an actuating rod pivotally but non-rotatably connected to said lever arm and projecting generally away from said backrest; and

means for selectively effecting push-pull reciprocal movement of said actuating rod, including a worm gear nut mounted in a fixed operating position on said frame and engaging threadedly with a portion of said actuating rod, there being a worm gear meshing with said nut and drivingly coupled with an electrical drive motor mounted on said frame.

3,890,001

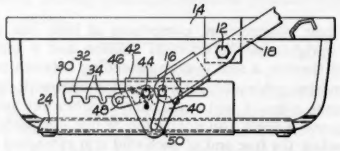
VEHICLE SEATS

Harold Roy Turner, Sutton Coldfield, England, assignor to H. R. Turner (Willenhall) Limited, Walsall, County of Stafford, England

Filed Jan. 2, 1974, Ser. No. 430,089

Int. Cl. B60n *1/02*

U.S. Cl. 297—341 **4 Claims**



1. A vehicle seat comprising a seat cushion frame mounted to slide forwardly and rearwardly in a fixed slide structure, a seat back hinged to said frame, which has an extension that projects beyond the hinge axis and carries a pivot that is mounted on said fixed structure, to cause the seat cushion frame to slide forwardly in said fixed structure when the seat back is folded forwardly from its normal position, wherein the improvement comprises an intermediate mounting plate which is provided with a single upwardly extending slot in which said pivot of the seat back extension is slidable and which is slidably mounted on said fixed structure for forward and rearward adjustment to determine the normal fore-and-aft position of the seat relative to the fixed structure.

3,890,002

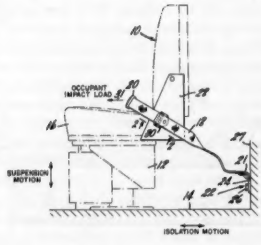
SEAT BELT ARRANGEMENT

Terry L. Warmskessel, Wescoesville, Pa., assignor to Mack Truck, Inc., Allentown, Pa.

Filed May 10, 1973, Ser. No. 359,190

Int. Cl. A62b *35/00*

U.S. Cl. 297—385 **10 Claims**



1. In a seat belt arrangement for a vehicle seat, at least a portion of which is movable relative to at least a portion of a vehicle structure, including a seat belt, and means anchoring the seat belt to the portion of the vehicle structure, the improvement comprising means releasably coupling the seat belt to the movable portion of the vehicle seat so as to provide slack in the seat belt between the anchoring means and the releasable coupling means to permit relative movement between the movable portion of the vehicle seat and the portion of the vehicle structure even when a portion of the seat belt is securely engaging an occupant of the seat, the portion of the seat belt adapted to engage an occupant of the vehicle seat being secured by the releasable coupling means to the movable portion of the seat under loads exerted on the seat belt up to a predetermined impact load, the releasable coupling means being adapted to release the occupant engaging portion of the seat belt, with the seat belt being unconstrained by any portion of the coupling means engaging the belt, in response to a load exerted on the seat belt exceeding the predetermined impact load so as to transfer the load on the seat belt from the movable portion of the vehicle seat to the anchoring means.

3,890,003

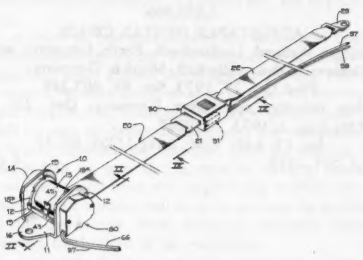
FREE PULL RETRACTOR

Albert R. Close, Sylmar, Calif., assignor to American Safety Equipment Corporation, New York, N.Y.

Filed May 9, 1974, Ser. No. 468,431

Int. Cl. A62b *35/00*; **B65h** *75/48*; **H01h** *3/16*

U.S. Cl. 297—388 **10 Claims**



1. A seat belt retractor comprising:

reel means for winding seat belt webbing therearound and reel locking pawl means movable between a first position whereby said pawl means permits unreeling of said webbing and a second position preventing unreeling;

blocking means associated with said reel movable between a blocking position whereby it prevents said locking pawl means from moving to its second position and an inactive position permitting said locking pawl means to move to its second position;

electromagnet means to hold said pawl blocking means in its blocking position on activation of said electromagnet means whereby said reel is free to reel and unreel until said seat belt is buckled, said electromagnet means when deactivated releasing said blocking means on said buckling to allow said locking pawl means to thereafter prevent unreeling of said reel; and

sensing means to sense when said seat belt is buckled and to deactivate said electromagnet.

3,890,004

BODY SUPPORT

Larry E. Rail, 1430 Wallace Ct., Pinole, Calif. 94564

Filed Jan. 16, 1974, Ser. No. 433,748

Int. Cl. A47c *7/50*

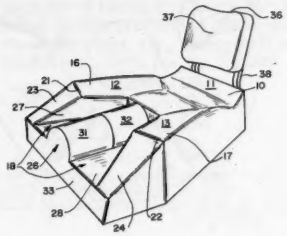
U.S. Cl. 297—423 **7 Claims**

1. A body support comprising:

a first cushion portion having a top surface formed and dimensioned to receive and support the buttocks of a person when seated thereon;

a pair of laterally spaced second cushion portions contiguous to said first portion and extending in a normally forward direction therefrom and having top supporting surfaces substantially flush with said first portion surface and being dimensioned and positioned to support the user's thighs;

said portions defining a cavity for the user's feet when the user is sitting cross-legged on said support;



a third cushion portion positioned forwardly of said first portion and medially between said second portions and dividing said cavity into a pair of recesses for receiving the user's feet when the user is seated cross-legged on said support; and

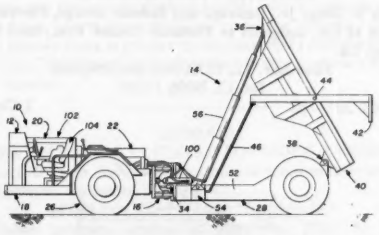
the top surface of said third portion having an elevation receiving and supporting each leg crus when the user is seated in cross-legged position with the user's feet positioned in said recesses.

3,890,005

ARTICULATED FRAME MINE DUMPER

Gerald Bruce Sien, Carlsbad, N. Mex., assignor to Sien Equipment Company, Carlsbad, N. Mex.

Filed June 6, 1974, Ser. No. 476,930
Int. Cl. B62d *59/00*
U.S. Cl. 298—22 P **12 Claims**



1. An articulated frame mine dumper comprising:

a towing vehicle including a frame, an engine mounted on the frame, transmission means, and drive wheels supporting the vehicle for movement over a surface and operatively connected to the engine through the transmission means for propelling the vehicle;

a towed vehicle including a frame, wheels supporting the frame for movement over a surface, a dump body pivotally supported on the frame, and hydraulic cylinder means for selectively pivoting the dump body between material receiving and material dumping positions;

a subframe connected to the frame of the towed vehicle for pivotal movement about a vertical axis;

hydraulic cylinder means connected between a frame of the towed vehicle and the subframe and hence the frame of the towing vehicle to effect steering of the articulated frame mine dumper by selectively pivoting the frames of the towed vehicle and the towing vehicle with respect to each other about the vertical axis of pivotal movement of the subframe;

an outer pipe section secured to the frame of the towing vehicle and having a horizontal axis;

bushing receiving grooves formed in the interior of the outer pipe section at the extreme opposite ends thereof;

an inner pipe section secured to the subframe and extending through the outer pipe section;

bushings received in the bushing receiving grooves of the outer pipe section for rotatably supporting the inner pipe section and for preventing relative angular displacement between the inner and the outer pipe sections;

a retaining ring secured to the exterior of the inner pipe section at the end thereof remote from the subframe for preventing relative axial displacement between the inner and outer pipe sections; and

thrust washers positioned between the subframe and the outer pipe section and between the outer pipe section and the retaining ring;

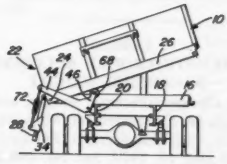
whereby the frame of the towing vehicle is permitted to pivot relative to the frame of the towed vehicle about a horizontal axis.

3,890,006

BEET DOOR OPERATOR

Orville E. Stockwell, 536 First Ave. South, Greybull, Wyo. 82426

Filed Dec. 7, 1973, Ser. No. 422,783
Int. Cl. B60j *1/04*
U.S. Cl. 298—23 D **10 Claims**



1. In combination, a side dumping vehicle of the type including a pair of opposite side longitudinal beams interconnected at points spaced therealong by means of transverse members extending therebetween, a load bed including a bottom wall interconnecting opposite side and end walls pivotally supported at opposite ends adjacent one of its side walls from corresponding ends of said transverse members for swinging of said load bed about aligned axes between an upright transport position and an inclined dumping position with the other side of said load bed elevated relative to said one side, the side wall extending along said one side of said load bed comprising a door and being pivotally supported from the latter for swinging of said door between a closed upstanding position and an open position with the upper marginal edge of said door swung outwardly and downwardly, an operator for said door, said operator including a pair of L-shaped levers including long upstanding arms and short horizontal arms, pivot means pivotally supporting said levers, at the juncture of the long and short arms thereof, from opposite end portions of the longitudinal beam adjacent said one side of said load bed for oscillation about generally aligned axes extending longitudinally of said load bed and with said short arms projecting toward the remote side of said load bed and said long upstanding arms spaced inwardly from the adjacent ends of said door, a pair of elongated tension members each having one end pivotally connected to the free end of a corre-

sponding end of said door at a point spaced above the axis of oscillation of said door and having the opposite end connected to the free end of the long arm of the lever associated therewith, the free end portions of said short arms having roller means journaled therefrom and displaced laterally outwardly therefrom to a position underlying the corresponding end marginal portion of said load bed with the upper peripheral portions of said rollers rollingly engaged with the adjacent undersurface portions of said end marginal edge portions of said load bed.

3,890,007

CHEMICAL MINING OF COPPER PORPHYRY ORES

Harold J. Heinen, Reno; Thomas G. Carnahan, Sparks, and Judith A. Eisele, Verdi, all of Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Feb. 7, 1974, Ser. No. 440,432
Int. Cl.[2] E21C *41/14*
U.S. Cl. 299—4 **8 Claims**

1. A process for extracting copper from a porphyry ore containing chalcopyrite which comprises:

contacting said ore with a leach solution comprising an aqueous mixture of sulfuric acid and a salt chosen from the group consisting of sodium chloride, potassium chloride and ammonium chloride in the presence of free oxygen at a temperature above about 60°C for a time sufficient to dissolve chalcopyrite contained in said ore and to attain a pH of said leach solution of above about 0.5 but below about 3.0 thereby precipitating iron dissolved by said leach solution within the ore as a granular, crystalline jarosite having the formula $MFe_3(SO_4)_2(OH)_6$ wherein M is chosen from the group consisting of sodium, potassium and ammonium ions;

separating spent, copper-containing leach solution from the ore, and

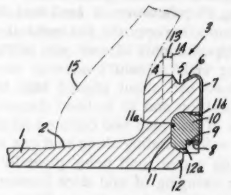
recovering copper from the leach solution.

3,890,008

WHEEL RIM WITH TROUGH ACCOMMODATING BALANCING WEIGHT

Daniel Lejeune, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie., Clermont-Ferrand (Puy-de-Dome), France

Filed June 17, 1974, Ser. No. 480,246
Claims priority, application France, June 20, 1973, 73.22599
Int. Cl. B60b *13/00*
U.S. Cl. 301—5 B **4 Claims**



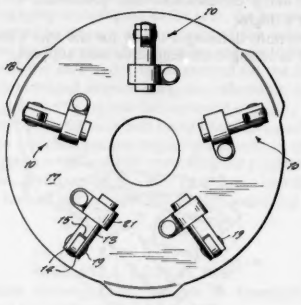
1. A wheel rim for mounting a pneumatic tire formed with tire beads and comprising a rim base extended on opposite sides by a bead seat and by a rim edge, at least one of the rim edges being intended to be equipped with a balancing weight secured by a fastener, characterized in that at least said one rim edge is widened axially and is formed on its radially outer periphery with a groove in a portion located beyond the zone of contact with the tire bead and on its axially outer periphery with a circumferential trough, the trough accommodating the weight and the groove providing anchorage for the radially outer end of the fastener.

3,890,009

EASY OFF WHEEL RETAINER

Thomas Hummel, 230 Mulberry Dr., Glenwood, Ill. 60425

Filed Oct. 3, 1973, Ser. No. 408,081
Int. Cl. B60b *3/14*
U.S. Cl. 301—9 DN **6 Claims**



1. An easy off wheel retainer construction fixedly securing a wheel to a supporting automotive vehicle axle, the combination of a plurality of retainer means being mounted in an annular arrangement upon the end of a brake drum, said arrangement of retainer means being generally concentric with the central axis of said brake drum and the axle of the automotive vehicle, and,

each of said retainer means including a lug secured to and projecting outwardly from said brake drum and a retainer member being pivotally attached to the end of said lug,

said wheel including an outer rim and a wheel web extendable over each of said retainer members and lugs adjacent said brake drum,

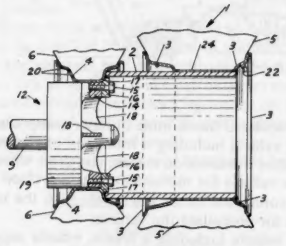
clamp means associated with each retainer means and mounted on said web whereby said clamp means is movable around said associated pivotal retainer member for holding same against the web to hold the wheel web on the brake drum.

3,890,010

FLOTATION/TIRE/ASSEMBLY

Curtis N. Dove, Jr., Bastrop, and Jimmie George, Merrouge, both of La., assignors to Flotation Trailer Trac, Inc., Bastrop, La.

Filed Apr. 12, 1973, Ser. No. 350,506
Int. Cl. B60b *15/26*
U.S. Cl. 301—52 **2 Claims**



1. A flotation tire assembly for removable mounting on the hub and drum assembly of a vehicle comprising:

a. An essentially cylindrically shaped hub of fixed length;

b. A flotation tire rim mounted on said hub;

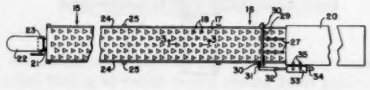
c. A substantially low pressure flotation tire mounted on said flotation tire rim;
d. A stabilizing tire rim mounted on said hub in essentially parallel relationship to said flotation tire rim;
e. A substantially high pressure stabilizing tire having a smaller diameter then said flotation tire mounted on said stabilizing tire rim; and
f. A hub assembly in cooperation with said stabilizing tire rim for releasably securing said flotation tire assembly to said hub and drum assembly.

3,890,011

SUPPLYING OBJECTS FROM AN AIR-FILM CONVEYOR RAPIDLY AND INTERMITTENTLY TO A MACHINE

Rudolph E. Futer, 1501 Park Ave., Emeryville, Calif. 94608

Filed July 10, 1972, Ser. No. 270,548
Int. Cl. B65g *51/00*
U.S. Cl. 302—31 **6 Claims**



1. An air-film conveyor for conveying articles thereon to a delivery point at the end thereof, comprising

means defining an elongate conveyor table having a delivery end to which articles thereon are conveyed,

means for providing a moving air film along the upper face of said conveyor table throughout the length thereof for both supporting articles thereon against gravity and continuously urging such articles in a downstream direction toward the delivery end of said conveyor table, and

means for periodically stopping the downstream movement of articles on said conveyor table at a point adjacent said delivery and thereof,

said elongate conveyor table including a downstream section adjacent said delivery end and extending throughout a selected length thereof upstream of said stopping means, and an upstream section extending throughout a length thereof upstream of said downstream section, and means for providing throughout said downstream section of said table a force urging articles thereon in a downstream direction greater than that of said upstream section,

whereby the acceleration of articles from a stationary condition to a moving condition under the influence of such greater force is greater throughout said downstream section of said conveyor table than in said upstream section thereof.

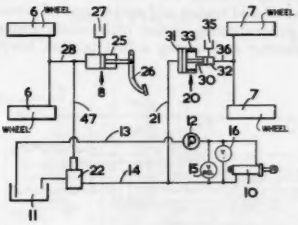
3,890,012

HYDRAULIC BRAKES SYSTEM FOR MOBILE VEHICLES

Peter J. O'Toole, Newtown, Australia, assignor to International Harvester Company, Chicago, Ill.

Filed Feb. 27, 1974, Ser. No. 446,173
Claims priority, application Australia, Mar. 5, 1973, 2477/73
Int. Cl.² B60T *13/16*
U.S. Cl. 303—6 R **4 Claims**

1. In a mobile vehicle having a hydraulic accessory system including a fluid return conduit; first and second pairs of vehicle supporting wheels including brakes therefor; a hydraulic pressure actuated main brake system means for operating the brakes of the first pair of wheels including operator actuated means for pressurizing the main brake system means and applying the brakes of the first pair of wheels; a hydraulic pressure actuated auxiliary brake system means for operating the brakes of the second pair of wheels including a hydraulic intensifier means having a low pressure side connected for communication to the return conduit and a high pressure side communicating with the auxiliary brake system for pressurizing same and applying the brakes of the second pair of wheels; a control valve means in the return conduit downstream of the point of connection of the intensifier means to the return conduit for varying the pressure in the return line upstream of the control valve means, the control valve means being pressure responsive and connected for communication to the main brake system means operable in response to pressurization of the main brake system means for operating the control valve to restrict the flow in the return conduit and increase the pressure in the low pressure side of the intensifier means for pressurizing the high pressure side and activating the brakes of the second pair of wheels.

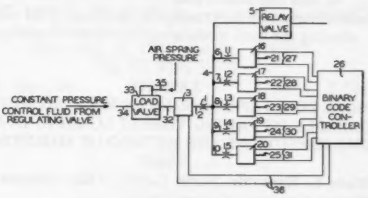


3,890,013

ELECTRICALLY CONTROLLED FLUID PRESSURE SYSTEM FOR CONVERTING DIGITAL CONTROL SIGNALS TO ANALOG SIGNALS

Ronald W. Coiner, Irwin, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Jan. 28, 1974, Ser. No. 436,851
Int. Cl. B60t *13/68*
U.S. Cl. 303—20 **12 Claims**



1. Apparatus for converting digital control pressure to analog control pressure to be transmitted to a vehicle brake control device operable responsively thereto, said apparatus comprising:

a. a supply conduit pressurizable at a constant pressure and via which control fluid pressure may be supplied to the vehicle brake control device;

b. a plurality of venting means connected to said supply conduit in parallel relation to each other; and

c. operator controlled means for selectively effecting opening and closing said venting means, either singly or in any combination thereof, for establishing a desired analog control pressure in said supply conduit.

3,890,014

DIRECTIONALLY RESPONSIVE BRAKING SYSTEM

Edward J. Hayes, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

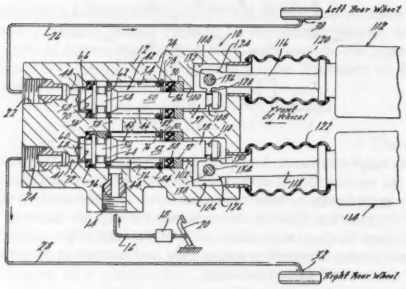
Filed May 16, 1973, Ser. No. 360,822
Int. Cl. B60t *8/00*
U.S. Cl. 303—24 R **17 Claims**

1. A brake system including a pedal operated source of

pressurized fluid and at least one fluid operated brake on each lateral side of a vehicle,

modulating valve means for performing a fluid modulating operation on the existing fluid pressure in said brake system and thereby varying the pressure to the brakes under preselected braking conditions, said modulating valve means comprising

a housing defining a fluid chamber communicable with one of said brakes and said source of pressurized fluid, a proportioning piston reciprocally disposed in said chamber and having a first portion having the fluid



pressure of said source acting thereon and a second portion having the fluid pressure of said brake acting thereon,

said piston being operable under the influence of said fluid pressure acting on said first and second portions thereof to move toward and away from a piston selectively blocking pressurized fluid from being communicated from said source thereof to said one brake, and thereby operate to modulate the fluid pressure supplied to said one brake, and

means responsive to a change in direction of the vehicle for altering the fluid modulating operation of said piston.

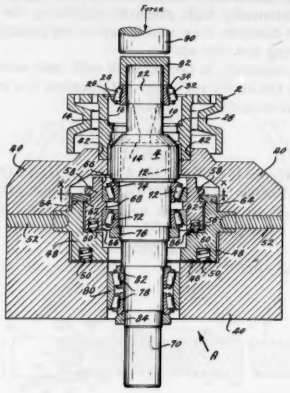
3,890,015

SINGLE ROW TAPERED ROLLER BEARING ASSEMBLY CAPABLE OF TAKING THRUST LOADING IN BOTH AXIAL DIRECTIONS AND METHOD OF ADJUSTING THE SAME

William E. Harbottle, North Canton, Ohio, assignor to The Timken Company, Canton, Ohio

Filed Jan. 16, 1974, Ser. No. 433,679
Int. Cl. F16c *29/12*
U.S. Cl. 308—1 R **10 Claims**

1. A process for adjusting a single row tapered roller bearing capable of taking thrust loading in both axial directions and including tapered rollers and inner and outer tapered confining surfaces for confining the rollers in the radial direction and end confining surfaces for confining the rollers in the axial direction, said process comprising: bringing the rollers into a condition of no end play with respect to at least one of the tapered confining surfaces and the end surface at the large diameter ends of the rollers whereby the rollers will bear firmly against those surfaces; holding one of the confining surfaces in a fixed axial position with respect to reference means located remote from the bearing; effecting movement in the axial direction between the inner tapered confining surface and the end confining surface at the large diameter ends of the rollers so as to cause the rollers to move out of the condition of no end play and into a condition of end play; thereafter moving one of the confining surfaces axially relative to another of the confining surfaces such that a force is transmitted through the rollers to cause still another of the confining surfaces to move in the axial direction relative to said another confining surface such that the relative movement brings the rollers closer to the condition of no end play, and terminating the relative movement between confining surfaces



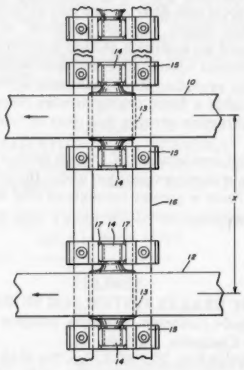
when the bearing adjustment measured at the remote reference means reaches a prescribed value.

3,890,016

BEARING CONSTRUCTION FOR IDLER ROLLS AND MAINTENANCE METHOD FOR IDLER ROLL BEARINGS

James T. Stull, Jackson Township, Butler County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed May 13, 1974, Ser. No. 469,263
Int. Cl. F16c *13/00*
U.S. Cl. 308—1 R **10 Claims**

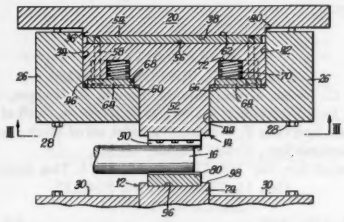


1. In a combination which includes an idler roll, bearings having central openings in which said roll is journaled at each end, respective pillow blocks receiving said bearings, and means supporting said pillow blocks, and in which the surface of each bearing at which wear is concentrated lies within one quadrant of its central opening toward which the resultant force is applied as the roll carries a load, an improved construction in which said bearings have identical external dimensions, the exterior shape of each bearing being symmetrical with respect to horizontal and vertical planes, said pillow blocks having openings for receiving the bearings in four different positions, whereby the wear on the bearings is distributed among four areas through the life of the bearing.

3,890,017
MACHINE SLIDE ASSEMBLY

Donald F. Blue, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 296,280, Oct. 10, 1972, Pat. No. 3,818,736. This application Feb. 1, 1974, Ser. No. 438,539
Int. Cl. F16c 29/00
U.S. Cl. 308—3 A 1 Claim

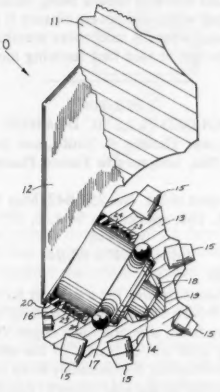


1. A machine slide assembly in a machine tool, comprising:
a housing having upwardly facing spaced apart guide surface means defining a T-shaped elongated cavity,
a slide member being movable through the T-shaped cavity in suspended relation along said guide surface means, and a plurality of spring biased bearing plates interacting between the upwardly facing guide surface means and the suspended slide member to maintain alignment therebetween when upwardly directed forces act upon the slide member and tend to cant it with respect to the guide surface means.

3,890,018
ROTARY ROCK BIT WITH WIPER PAD LUBRICATION SYSTEM

Robert Dale Clamon, Mesquite, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed July 19, 1974, Ser. No. 489,857
Int. Cl. F16c 33/66
U.S. Cl. 308—8.2 6 Claims

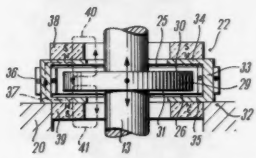


1. A rotary rock bit comprising:
a bit body including a bearing pin;
a rotatable cutter mounted upon said bearing pin, said rotatable cutter having a cutter interior surface;
at least one wiper pad cavity in said cutter interior surface; and
a wiper pad positioned in said wiper pad cavity.

3,890,019
MAGNETIC BEARINGS

Karl Boden, Oberteuringen, and Dietrich Scheffer, Friedrichshafen, both of Germany, assignors to Padana AG, Zug, Switzerland

Filed Mar. 19, 1973, Ser. No. 342,892
Claims priority, application Germany, Mar. 20, 1972, 2213470
Int. Cl. F16c 39/06
U.S. Cl. 308—10 19 Claims

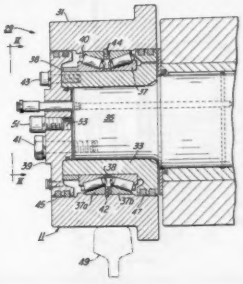


1. In a magnetic bearing for a body having a ferromagnetic portion: first means defining a first flux path; at least one permanent magnet in said first flux path and producing a magnetic field therein; second means defining a second flux path; said second flux path being non-coincident with said first path for a substantial portion of its length, a ferromagnetic part in said second flux path; an electromagnet winding for producing a magnetic field in said second flux path, said ferromagnetic part offering a high permeability to the last-mentioned magnetic field; and means for controlling electric current supplied to said winding to apply a controlled magnetic field to said ferromagnetic body portion.

3,890,020
WHEEL AND BEARING ASSEMBLY

Walter B. Thomas, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed May 21, 1973, Ser. No. 361,887
Int. Cl. F16c 35/12
U.S. Cl. 308—16 3 Claims

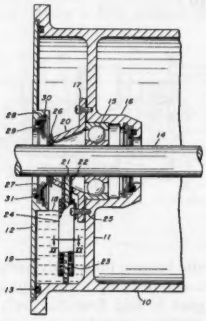


3. A wheel and bearing assembly for installation on a shaft comprising:
a. a sleeve that is adapted to fit onto said shaft;
b. a bearing mounted to said sleeve and cooperating with
c. a wheel surrounding said sleeve and cooperating with said bearing;
d. a plate secured to said sleeve for holding said wheel retatably in place on said sleeve; and
e. means on said plate for exerting an axial force against said shaft to urge said wheel and bearing said assembly off said shaft when said assembly is installed thereon.

3,890,021
BEARING LUBRICATION SYSTEM

Robert E. Smith, and Leroy C. Carter, both of Lima, Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 19, 1974, Ser. No. 443,886
Int. Cl. H01h 35/00
U.S. Cl. 308—126 8 Claims

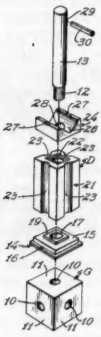


1. In combination, a rotatable shaft, bearing means for supporting said shaft, an oil reservoir below the shaft containing lubricating oil, a wick in contact with the oil, wick holder means engaging the shaft and holding the wick in position to make contact with the shaft, and resilient means urging the wick holder means against the shaft, the wick being free of said resilient means.

3,890,022
CORNER FITTING

Howard R. Moon, 42 Rockwell St., Fort Atkinson, Wis. 53538

Filed Sept. 3, 1974, Ser. No. 502,538
Int. Cl. A47f 3/00
U.S. Cl. 312—140 10 Claims



1. A corner fastener for connecting a square block and at least one square tubular member including:

a central recess in at least one surface of said square block,

a first pin engaged in said recess and held from rotative or axial movement relative thereto,

an expandable member of generally rectangular outline encircling said pin,

a cam plate on said expandable member and rotatable therewith,

a generally V-shaped notch in the end of said cam plate most remote from said block,

a cross-pin extending through said first pin intersecting the axis of said pin and extending in said V-shaped notch,

indentations in said cam plate on opposite sides of said notch,

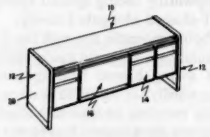
an end of said tubular member encircling said expandable member, whereby

rotation of said tubular member, expandable member and cam plate will displace said cross-pin from the base of said notch into said indentations, compressing the expandable member to secure said tubular member to said block.

3,890,023
END PANEL SUPPORT SYSTEM

Robert G. Mohr, Grand Rapids; Ronald R. Hodges, Grandville; Jack Hockenberry; Douglas Scheerhorn, both of Grand Rapids, and Gale F. Wilcox, Wayland, all of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

Division of Ser. No. 366,218, June 1, 1973. This application Oct. 11, 1974, Ser. No. 514,137
Int. Cl. A47b 47/04
U.S. Cl. 312—198 10 Claims



1. A system for supporting one or a number of standardized furniture components as desks, tops, cabinets or the like comprising: a supported member; end panel members adapted to support said supported member; first securing means in said end panels and said supported members for releasably securing same together; cover members for said end panels; second securing means in said cover members and said end panels for releasably securing said cover to said panel; said panel having peripheral edge; an access opening through said panel peripheral edge; a removable access closure in said peripheral edge for covering said access opening; and actuator means on said second securing means for releasing said cover member from said end panel, said actuator means being accessible through said access opening when said access closure is removed from said peripheral edge whereby said cover member may readily be removed for access to said first securing means.

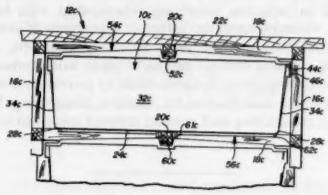
3,890,024
MOLDED PLASTIC DRAWER

Thomas S. Noneman; Thomas R. Smith, and John B. Stokes, all of Bryan, Ohio, assignors to Tomco Plastic Inc., Bryan, Ohio

Continuation-in-part of Ser. No. 252,847, May 12, 1972, Pat. No. 3,796,474. This application Sept. 4, 1973, Ser. No. 393,944
Int. Cl. A47b 88/04
U.S. Cl. 312—330 23 Claims

1. A molded plastic drawer for a cabinet having upper and lower guide rails which comprises a normally horizontal bottom wall including front, side and back edges; reinforcing ribs formed integrally with and disposed on the underside of the bottom wall and extending continuously from points adjacent the back edge parallel to the side edges to points adjacent the front edge and then parallel to the front edge to points adjacent the side edges, the portions of the reinforcing ribs extending parallel to the side edges being spaced apart to receive the lower guide rail of the cabinet, the portions of the reinforcing ribs extending parallel to the front edge being positioned for cooperation with the cabinet to restrain the drawer in the closed condition; back and side walls formed integrally with and rising upwardly and slightly outwardly from the back and

side edges of the bottom wall; a front wall integrally formed with and rising upwardly from the front edge of the bottom wall; an outwardly extending lip on the back and side walls and formed integrally therewith, the lip of the back wall being positioned above the lips of the side walls to provide an elongate shoulder for restraining the drawer in the opened condition and including a groove for receiving the upper guide rail



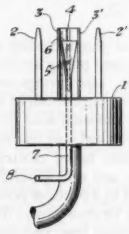
of the cabinet, at least the side walls each having a plurality of ribs formed integrally therewith and extending outwardly therefrom, each of said ribs extending first downwardly from the outer edge of the lip and then inwardly to define a stacking lug aligned with and spaced a predetermined distance from the corresponding portion of the lip for preventing excessive nesting of stacked drawers.

3,890,025

ELECTRICAL PLUG LOCK

Gene Louis Gray, 2833 S.W. 4th Ct., Fort Lauderdale, Fla. 33312

Filed Aug. 2, 1973, Ser. No. 385,104
Int. Cl. H01r *13/54*
U.S. Cl. 339—14 P **5 Claims**



1. A positive connection means for a three-way male electrical connector that is not normally electrically connectable to a positive or negative electrical terminal comprising:

a body,

a male ground connector member with two projection sections, connected to said body,

a cam means movably positioned between said sections to move said sections apart to secure said grounded connector in a locked position in a female outlet,

a shaft connected to said cam means with a portion of said shaft positioned outside said body for easy access,

said shaft movable directly between a plurality of positions by sliding said shaft in order to position the cam at a desired position along said sections, and

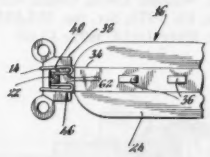
said shaft rotatable less than three hundred and sixty degrees to move said cam into engagement with said sections to lock said connector in a female socket.

3,890,026

WIRE-FORM GROUNDING CLIP FOR ELECTRICAL FIXTURES

Albert J. Gartland, Jr., Trumbull, Conn., assignor to Harvey Hubbell, Incorporated, Bridgeport, Conn.

Filed Mar. 14, 1974, Ser. No. 451,183
Int. Cl. H01r *9/00*
U.S. Cl. 339—21 R **12 Claims**



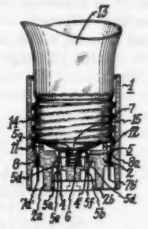
2. In combination, a grounding clip and an electrical fixture; said electrical fixture being of the type having a grounded mounting yoke with mounting slots formed therein whereby the fixture is arranged to be secured in a mounting box by mounting screws which extend through said slots; and said ground clip comprising a continuous strand of spring wire having end terminations, said strand being formed into an upper loop and a lower loop, said upper and lower loops being separated by a gap and being superposingly aligned to create a screw receiving means therebetween for engaging a mounting screw, said terminations affixingly in none mounting yoke slot when said grounding clip is disposed on the electrical fixture with the mounting yoke thereof disposed in said gap and said screw receiving means aligned through the slot, said upper and lower loops being forced to converge against the mounting yoke thereafter when the mounting screw is tightened in said screw receiving means.

3,890,027

ELECTRICAL SOCKET

Wallace H. Orr, and James L. Grindle, both of Hendersonville, N.C., assignors to General Electric Company, New York, N.Y.

Filed Nov. 1, 1973, Ser. No. 411,672
Int. Cl. H01r *17/20*
U.S. Cl. 339—64 R **9 Claims**



1. An electrical socket comprising, in combination, a socket housing having an open end and a transverse base portion near its other end and having a central axis, said housing base portion having a pair of spaced slots extending therethrough on opposite sides of said central axis, resilient means arranged on said housing base portion between said slots, and U-shaped conductive contact means having a pair of legs respectively extending loosely through said slots and having a web portion engaging said resilient means, said legs having electrical terminal means for making an electrical connection to said contact means, and securing means movably holding said contact means on said housing base portion with said web portion pressed in yieldable engagement against said resilient means,

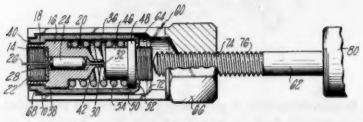
said contact means being freely movable in all directions to accommodate the position of an electrical device adapted to be received in said socket housing in engagement with said contact means.

3,890,028

THEFT PROOF TERMINATOR SYSTEM FOR CABLE TV OUTLETS

John P. Blanchenot, Agincourt, Ontario, Canada, assignor to Hi-G Incorporated, Windsor Locks, Conn.

Filed Sept. 10, 1973, Ser. No. 395,583
Int. Cl. H01r *13/54*; H01c *13/00*
U.S. Cl. 339—85 **11 Claims**



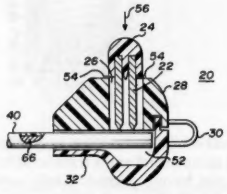
1. An electrical terminator system for preventing unauthorized connection to coaxial cable, tap devices and similar electrical terminals comprising an electrical terminator unit and a complementary installation tool coacting with the electrical terminator unit for rapid installation and removal thereof, said electrical terminator unit including a housing, a plug loosely mounted in the housing adjacent one end thereof for rotation relative thereto, said plug including a resistive load and having rotary connecting means for connection to a terminal being terminated, a rotary drive member mounted in the housing in spaced relationship to said plug and adapted for movement toward said one end into engagement with said plug for imparting rotary motion thereto to connect the plug to said terminal and biasing means urging said rotary drive member out of driving engagement with said plug, said installation tool including a terminator mount cooperating with said terminator housing and holding the terminator unit and a drive stem on the terminator mount operative for driving said rotary drive member toward said one end into engagement with said plug against the bias of said biasing means while the terminator unit is held by the mount.

3,890,029

PARTITIONED ELECTRICAL CONNECTOR

Hyman Izraeli, West Caldwell, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Feb. 19, 1974, Ser. No. 443,911
Int. Cl. H01r *13/38*
U.S. Cl. 339—98 **11 Claims**



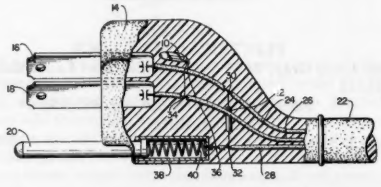
1. An electrical connector comprising: a base portion having wire receiving channels extending therewithin, and partitions selectively spaced from one another to define said wire receiving channels; a cover portion adapted to mate with and overlie said base portion, said cover portion having a selectively formed aperture extending generally transversely therethrough; means for locking said cover portion to said base portion; contact support means selectively movable from a first position to a second position transversely within said cover portion aperture and disposed in said cover portion in said first position generally adjacent said cover portion aperture; and slotted metallic contact means fixedly disposed within said contact support means and movable therewith, said contact means being aligned to intersect said wire receiving channels when said contact support portion is depressed within said cover portion aperture and moved from said first position to said second position after said cover portion is disposed in selective overlying relationship with said base portion, whereby upon the selective placement of conductors within said base portion wire receiving channels, and the depression of said contact support means, said contact means is caused to engage such conductors to provide a connection therebetween, said connector further comprising frangible segments connecting said contact support means to said cover portion.

3,890,030

LACK OF GROUND INDICATOR

Johnny B. McDaniel, 4210 Stanby Ct., Alexandria, Va. 22312

Filed Sept. 27, 1973, Ser. No. 401,393
Int. Cl. H01r *13/66*
U.S. Cl. 339—113 L **10 Claims**



1. In an electrical plug including a body of insulated material, a first and second prong secured in said body, a ground prong in said body, said prongs being electrically insulated from each other, the improvement comprising a resistor electrically connected between said first prong and said ground prong; and said electrical plug having a single indicator means, said indicator means being electrically connected between said second prong and said ground prong whereby said first prong is connected to a positive power line, said second prong is connected to a neutral power line, and ground prong is connected to a ground line, and said indicator means is activated upon the absence of a ground.

3,890,031

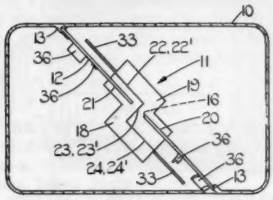
BULBHOLDER ASSEMBLIES FOR LAMP UNITS

Walter Kenneth Bryant, Shirley, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed Dec. 27, 1973, Ser. No. 428,799
Claims priority, application United Kingdom, Jan. 9, 1973, 1208/73
Int. Cl. H01r *13/54*
U.S. Cl. 339—119 L **8 Claims**

1. A lamp unit comprising a lens element, and a bulbholder assembly, the bulbholder assembly including a plate received at its ends in recesses formed in said lens element, said plate having a pair of spaced, bulb receiving apertures therethrough and a slot between said apertures, a pair of electrically insulating members having mutually engaging surfaces, said insulating members being lodged in said slot and having recesses in

the mutually engaging surfaces thereof, and a pair of contact elements disposed in said recesses in the mutually engaging



surfaces and extending from said insulating members to lie respectively opposite said apertures.

3,890,032

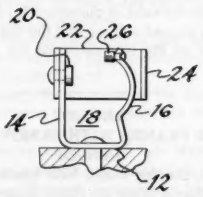
REJECTION TYPE FUSE HOLDER

Robert S. Tillson, Terryville, Conn., assignor to General Electric Company, New York, N.Y.

Filed Jan. 16, 1974, Ser. No. 433,824

Int. Cl. H01r *13/16*

U.S. Cl. 339—258 F **2 Claims**



1. A fuse clip for accommodating the ferruled end terminal of a fuse, wherein the fuse terminal is keyed with an annular groove, said fuse clip comprising, in combination:

A. a pair of upstanding, spaced arms defining therebetween a pocket for the fuse terminal,

1. one of said arms being straight sided, and

2. the other of said arms being deflectable and having an outwardly bowed mid-portion conforming to an arcuate side portion of the fuse end terminal, the upper termination of said other arm just above said bowed mid-portion abruptly turned outward to provide a crook;

B. interference means including a first obstruction carried on an upper portion of said one arm and a rigid second obstruction carried by said other arm of said crook therein, said obstructions being transversely aligned and sized for reception in the annular groove in a fuse terminal as accommodated in said pocket; and

C. limiting means including an abutment disposed externally of said pocket in contiguous relation to the upper portion of said other arm for establishing a maximum separation between said obstructions which is less than the major transverse dimension of a fuse end terminal, said obstructions engaging the outer surface of a fuse terminal lacking the keying groove to impose a separation between said obstructions necessary for insertion in said pocket greater than permitted by said abutment, thereby to reject insertion.

3,890,033

ADJUSTABLE-SPRING ATTENUATOR FOR RADIATED BEAMS

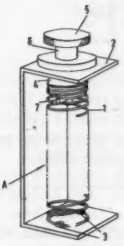
Kevin McGee, Newcastle-upon-Tyne, England, assignor to Sir Howard Grubb Parsons & Co., Limited, Newcastle-upon-Tyne, England

Filed Feb. 13, 1974, Ser. No. 441,991

Claims priority, application United Kingdom, Feb. 13, 1973, 6961/73

Int. Cl. G02f *1/28*

U.S. Cl. 350—266 **4 Claims**



1. A variable attenuator for use in a radiated beam path comprising at least one obturating element which element is capable of varying its physical form, whereby according to the degree of such variation the element may of itself, or in combination with other elements, attenuate a radiated beam path in which it is placed to a greater or lesser degree; and control means operatively connected to said obturating element for providing gradual variation in the physical form of the element, said obturating element comprising an elongated, cylindrical helical coil spring for location with the longitudinal axis of the coil spring normal to the beam path being attenuated, the coil density of the spring in the beam path being substantially infinitely controllable within the physical distortion limits of the cylindrical, helical coil spring, the spring defining a cylinder in elevation for disposition across the full height or width of the beam to be attenuated and variations of the spring coil density causing an alteration in the number of turns of the spring met by the beam and thus altering the degree of the obscuration, said coil spring being fixedly anchored at one end, and said control means comprising a cylinder element connected axially to the other end of the coil spring, said coil spring being continuously under stress, and means for adjustably rotating the cylinder to impose torque on the individual helical coils of the spring for altering the diameter of the cylindrical coil and the spacing between adjacent helical coils of the spring.

3,890,034

OPTICAL SCANNER

Johann Ploeckl, Unterhaching, Germany, assignor to Zellweger AG, Uster, Switzerland

Filed July 20, 1973, Ser. No. 381,282

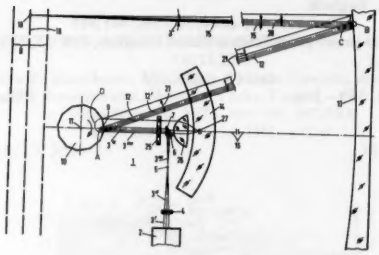
Claims priority, application Switzerland, Aug. 22, 1972, 12446/72

Int. Cl. G02b *17/00*

U.S. Cl. 350—7 **4 Claims**

1. An optical scanner comprising means for generating a bundle of scanning light rays from which there is formed a bundle of received light rays, at least one optical element conjointly associated with both said bundle of light rays, said

optical element having impingement areas for both bundle of light rays which are spatially offset with respect to one another, said impingement areas being located at a common impact surface of the optical element.



3,890,035

COMPLEX LIGHT SPATIAL MODULATOR

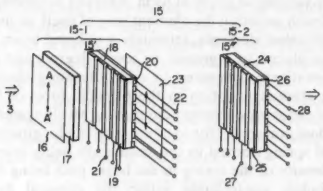
Yasutsugu Takeda, Kokubunji, Japan, assignor to Hitachi, Ltd., Japan

Filed Sept. 15, 1972, Ser. No. 289,263

Claims priority, application Japan, Sept. 17, 1971, 46-71806

Int. Cl. G02f *1/26*

U.S. Cl. 350—150 **5 Claims**



1. A complex light spatial modulator comprising:

two modulator means for respectively modulating an incident light wave as regards one different factor taken from three factors of the light wave, that is, the amplitude, the phase and the direction of polarization according to given three-dimensional information;

each of said two modulator means including a plate of ferroelectric crystal with a plurality of parallel strips of transparent electrode provided on each surface of said ferroelectric plate, the direction of the strips on one surface being crosswise to those on the other surface, an electric signal representing said three-dimensional information being applied across said ferroelectric plate though said transparent electrodes, and said two modulator means being disposed in tandem with respect to the incident light.

3,890,036

ZOOM LENS SYSTEM

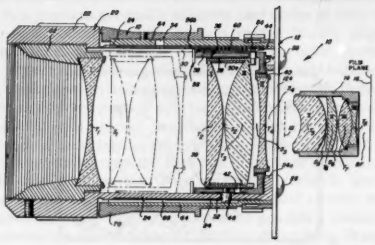
David S. Grey, Lexington, Mass., assignor to Berkey Photo, Inc., Paramus, N.J.

Filed Feb. 28, 1974, Ser. No. 446,704

Int. Cl. G02b *15/00*

U.S. Cl. 350—184 **8 Claims**

1. A zoom lens system made substantially according to the following table:



LENS ELEMENT	RADII (mm.)	THICKNESS AND SPACING (mm.)
I	R_1=64.90	T_1=1.207
	R_2=42.190	S_1= Variable (29.612 to 4.785)
II	R_3 Plano	T_2=4.414
	R_4=36.609	S_2=0.118
III	R_5=27.589	T_3=6.602
	R_6=92.480	S_3= Variable (1.897 to 5.307)
IV	R_7=92.467	T_4=1.208
	R_8=92.467	S_4 to Stop = Variable (7.098 to 28.515)

where the lens elements are numbered from front to rear in the first column, the radii of curvature R of the lens elements are given in the second column and the spaces S between and the thickness T of the lens elements are given in the third column.

3,890,037

SPECTACLE FRAMES WITH REMOVABLE TINTED LENSES

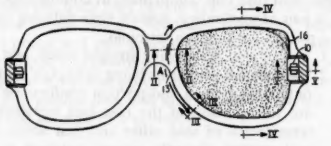
Dino Zingarelli, Darling Point, New South Wales, Australia, assignor to Martin Wells Pty. Ltd., Australia

Filed Dec. 18, 1973, Ser. No. 425,809

Claims priority, application Australia, Dec. 28, 1972, 1734/72; Feb. 7, 1973, 2164/73

Int. Cl. G02c *9/04*

U.S. Cl. 351—47 **9 Claims**



1. A spectacle frame having permanent fixed lenses and a lens holding portion surrounding each permanent lens and provided with a pair of substantially opposed abutment means which in their entirety are integral and form one piece with said lens holding portion such that an additional tinted flexible plastic lens having an outline corresponding to said lens holding portion and provided with appropriate curvature can be engaged with one of said abutment means and thereafter snapped past the other to be retained in position on the lens holding portion between said pair of abutment means and the permanent lens, said pair of abutment means extending rearwardly from the remainder of each lens holding portion so that each additional lens is situated behind a permanent lens, said pair of abutment means respectively forming an integral part of each lens holding portion at an inner peripheral region thereof adjacent a bridge of the frame and an integral part of

each lens holding portion at the region of a temple hinge of the frame, with the abutment means at the region of said temple hinge having the configuration of a boss, and both of said abutment means having inner surface regions directed inwardly toward a central part of each lens holding portion, and said surface regions being undercut for overhanging said permanent lens and an edge region of each additional lens to retain the latter temporarily in position behind each permanent lens.

3,890,038

EXPOSURE DEVICE FOR TRANSMITTING LIGHT WAVES MODULATED TO CONTAIN INFORMATION

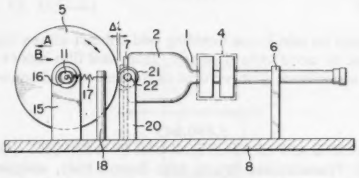
Junji Ichikawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 9, 1973, Ser. No. 358,484

Claims priority, application Japan, May 12, 1972, 47-46988; June 12, 1972, 47-58327

Int. Cl. G03b *27/00*

U.S. Cl. 355—1 **14 Claims**



1. An exposure device for recording light waves modulated to contain information comprising:

a photosensitive member, a source of light waves modulated to contain information, a light transmission member provided near said source; and

means for adjusting and maintaining the degree of contact or distance between the photosensitive member and the light transmission member;

said adjusting means retaining the light transmission member freely movable relative to the photosensitive member; whereby said modulated light waves are transmittable through said transmission member and recordable on said photosensitive member with high resolving power and clearness.

3,890,039

ELECTROGRAPHIC DEVICES FOR THE DEVELOPMENT COMPOSITION AND TRANSFER OF PARTICLES IMAGES

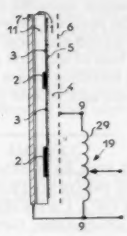
Marcus Cantarano, 47 Ave. F. Roosevelt, Thiais, France

Division of Ser. No. 870,405, Dec. 8, 1969, Pat. No. 3,741,761, which is a continuation-in-part of Ser. No. 631,792, April 8, 1967, abandoned. This application Apr. 16, 1973, Ser. No. 351,099

Int. Cl. G03g *15/00*

U.S. Cl. 355—3 R **24 Claims**

1. A device for producing electrographic images from a conductivity pattern formed by areas having differing electric conductivity characteristics ranging from an area exhibiting maximum conductivity to an area exhibiting minimum conductivity, comprising an insulating backing member onto which said conductivity pattern is affixed, means for coating said conductivity pattern with a thin layer of developer particles capable of receiving electric charges, an insulating layer against said conductivity pattern so that said coated conductivity pattern is electrically insulated between said insulating backing member and said insulating layer, means for generating an alternatively modulated electric field of sufficient strength across said insulating backing member and said insulating layer to transfer alternating electric charges from said conductivity pattern to said particles layer and to electrically attract particles having successive opposite polarities away from said conductivity pattern whereby a portion of said particles is sufficiently charged and removed from said conductivity pattern by proceeding in the application of said electric field, and the remaining part of said particles is insufficiently charged so that it continues to coat said conductivity pattern whereby producing a stable electrographic image.



3,890,040

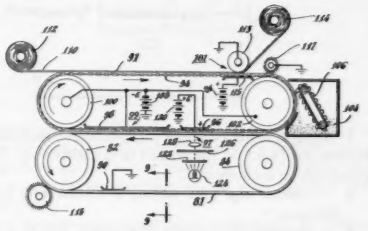
INDUCTION IMAGING APPARATUS

Fred W. Schmidlin, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 212,220, Dec. 27, 1971, abandoned. This application Aug. 29, 1973, Ser. No. 392,599

Int. Cl. G03g *15/00*

U.S. Cl. 355—16 **4 Claims**



1. An imaging apparatus comprising:

a first member including a thin layer of photoconductive material overlying a layer of material which produces an electrical charge blocking contact with said photoconductive material;

first transport means for transporting said first member through imaging and development stations sequentially;

a second member;

second transport means for bringing said second member into contact with said first member, for transporting said second member through imaging and developing stations in contact with said first member and for separating said second member from said first member at a location subsequent to a development station, said second transport means including means to apply a second electrical potential to said second member at a location preceding contact between said first and second member for causing image development material to adhere to the surface of said second member and means to apply said second electrical potential to said second member at a location subsequent to a development station for causing a developed image to adhere to the surface of said second member after separation of said first and second members;

means for depositing an image developing material including charged toner particles on said second member in a location preceding contact between said first and second members;

an imaging station including means for exposing said photoconductive layer of said first member and means for

applying a first electrical potential between said first and second members to provide an electrostatic image on the photoconductive surface of said first member;

a development station including means for applying said second electrical potential between said first and second members, said second electrical potential having a polarity opposite to that of said first electrical potential; and

a transfer station including means for transferring a developed image from said second member to a recordingg member.

3,890,041

ARRANGEMENT FOR EXPOSING PHOTOSENSITIVE MATERIALS WITH INFORMATION DISPLAYED ON THE SCREEN OF A CATHODE RAY TUBE

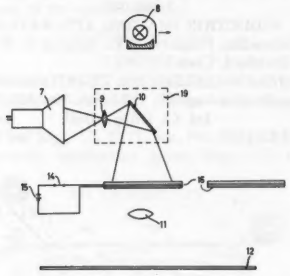
Herbert Henkler, Ludwigshafen, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 19, 1973, Ser. No. 417,258

Claims priority, application Germany, Nov. 21, 1972, 2256966

Int. Cl. G03b *27/00*; **G02f** *1/28*, *1/36*

U.S. Cl. 355—18 **5 Claims**



1. Apparatus for exposing photosensitive material to information displayed on the screen of a cathode ray tube which comprises in combination:

a. a cathode ray tube having a screen with information thereon;

b. a plurality of coplanar juxtaposed liquid crystal cells, each of said liquid crystal cells comprising two transparent electrodes and a photoconductor layer and a liquid crystal layer interposed therebetween and having means for applying a potential across said electrodes to record information projected thereon;

c. an optical system arranged in front of said cathode ray tube whereby said information on said screen can be projected onto said liquid crystal cells; and

d. light source means for exposing said photosensitive material to said information stored in said plurality of liquid crystal cells, at least one of said cathode ray tube and said optical system being movable relative to said liquid crystal cells so as to permit selective projection onto each said cell of said information on said screen, and at least one of said light source means, said optical system and said plurality of liquid crystal cells being movable relative to said photosensitive material so as to permit said light source means to expose said photosensitive material to said stored information.

3,890,042

MECHANISM FOR MOUNTING CONTACT SCREEN IN PHOTOENGRAVING CAMERA

Yoshio Miyauchi, Hikone, and Tetsuji Okuno, Shiga-ken, both of Japan, assignors to Dainippon Screen Seizo Kabushiki-Kaisha, Kyoto, Japan

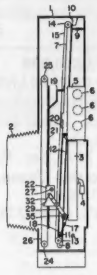
Filed Nov. 16, 1973, Ser. No. 416,365

Claims priority, application Japan, Nov. 16, 1972, 47-11427

Int. Cl. G03b *27/42*

U.S. Cl. 355—53 **10 Claims**

1. A contact screen mounting device for use in a photoengraving camera, comprising: a contact screen retaining frame adopted to retain a contact screen in front of a vacuum suction type film holder and movable to let said contact screen approach or separate from said film holder surface, and squeegee means adapted to move up and down so as to let said contact screen tightly attach to said film holder, and first guide



cam means on said frame enabling said contact screen retaining frame to move toward or away from said film holder surface in accordance with vertical movement of said squeegee means.

3,890,043

ENLARGING APPARATUS FOR USE IN A BRIGHT ROOM

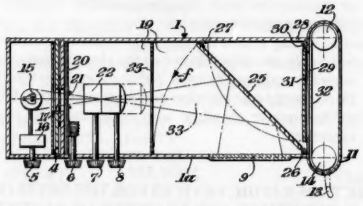
Wilmuth Pramstraller, Brixen near Bozen, Italy, assignor to Durst S.p.A. Fabbrica Macchine ed Apparecchi Fototecnici, Bolzano, Italy

Filed Sept. 20, 1973, Ser. No. 399,051

Claims priority, application Italy, Oct. 3, 1972, 30007/72

Int. Cl. G03b *27/52*

U.S. Cl. 355—62 **11 Claims**



1. An enlarging and viewing apparatus for use in a light room, comprising a rigid light-tight housing, the following components in said housing, a light source, a transparency-holding insert means for holding a transparency to be projected in front of the light source, variable projection optics which is variable in focal length, the wall of said housing opposite said light source having an opening for the projection of the picture to be copied on a projection surface disposed in said opening and having means for mounting light-sensitive photographic paper on said projection surface, an image-viewing window in a wall of said housing normally arranged to said projection surface, a swinging mirror having an axis of rotation at one side of said housing whereby it may be positioned at an angle between said projection surface and said image-viewing window screen for projecting an image on said window for adjusting it and whereby it may be swung out of the path of light projected to said projection surface for exposing said photographic paper, focal length control means on said variable projection optics for continuously varying the size and format of the picture projected on said projection surface, said opening in the path of light rays being light-tightly sealed in front of said projection surface by means of a cover, said swinging mirror being constructed and arranged to be maintained in an inclined position, for the adjustment of

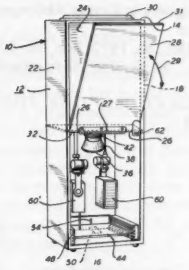
the apparatus for viewing the transparency and for the determination of the format to be copied, said swinging mirror being constructed and arranged to be moved toward and contiguous to said image-viewing window into a position which covers it and seals it for the exposure of said photographic paper, said swinging mirror and said cover also being constructed and arranged to permit exposure of the photographic paper, control actuating devices for said apparatus being mounted upon a control wall of said housing, said control actuating devices being operable from outside said control wall, said cover has a hinge connected on one of said walls adjacent said outlet, and the axis of rotation of said swinging mirror is mounted at said inlet upon another of said walls.

3,890,044

CAMERA APPARATUS

Morton Feren, Livingston, N.J., assignor to Martin H. Adler, Westfield, N.J.

Filed Mar. 13, 1974, Ser. No. 450,722
Int. Cl. G03b *27/52*
U.S. Cl. 355—62 **8 Claims**



1. Photographic apparatus for photographing jewelry displays or the like, comprising in combination:

a light-tight rigid enclosure means;

openable access means for permitting access to the interior of said enclosure;

means secured to a first wall of said enclosure for receiving a photosensitive plate to be exposed by said apparatus, said plate thereby defining the imaging plane of said apparatus;

lens means positioned within said enclosure at a plane parallel to said imaging plane, said lens means being carried by a lens-carrying plate which divides said enclosure and is permanently fixed with respect to said imaging plane and the lateral walls of said enclosure, whereby said lens means is at a fixed spacing with respect to said imaging plane;

an object-receiving tray disposed in vertically spaced relationship from said lens means, and on the side thereof opposite said imaging plane, for receiving objects thereon to be photographed;

means for moving said object-receiving tray toward or away from the fixed plane of said lens means to bring said object to a desired object distance from the said lens;

an internal wall of said enclosure carrying operator viewable indicia indicative of the field of focus in which an object on said tray should be positioned, whereby the spacing of said object with respect to said lens means may be effected by adjusting the position of said tray while observing the vertical positioning of said object as measured by said indicia;

indicia being provided on the surface of said tray indicating the periphery of the field of focus at a given vertical position of said tray, thereby enabling accurate centering of said object on said tray during photographing of said object;

at least one electronic flash exposure light means, disposed between said lens and object, for illuminating said object to be photographed; and

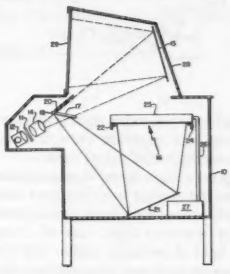
the space between said lens means and object-receiving tray being laterally bound by the rigid walls of said enclosure, whereby said space is variable solely in consequence of movement of said object-receiving tray, whereby the lighting characteristics of said space are substantially uniform for all positions of said object-receiving tray.

3,890,045

PHOTOGRAPHIC PRINTING APPARATUS

Herbert J. Bernstein, 43 Canton Ave., Amherst, Mass. 01002, and William J. Arnold, 73 Bardwell St., Florence, Mass. 01060

Filed Feb. 22, 1974, Ser. No. 444,854
Int. Cl. G03b *27/60*
U.S. Cl. 355—73 **1 Claim**



1. In a photographic printer-processor having a projector, a print exposure station, a roll-feed for providing printing paper to said exposure station and a processor for activating and stabilizing prints, the combination in said print exposure station comprising:

a. A fixed vacuum platen positioned adjacent to and above the path of travel of printing paper for supporting and holding printing paper uniformly flat during exposure;

b. a pair of edge support rails positioned below said vacuum platen providing a support surface for supporting printing paper within the pneumatic field of influence of said platen;

c. a guide plate positioned following said vacuum platen in the path of travel of said printing paper, the lower surface of said vacuum platen proximate to and overlapping the top surface of said guide plate; and,

d. a drive roller positioned above and coacting with said guide plate for driving said printing paper through said exposure station, said overlap providing vacuum pressure at the region of overlap.

3,890,046

CONDENSATION NUCLEUS DISCRIMINATOR

Edwin J. Hart, Hinsdale; Keelathur N. Vasudevan, Chicago, and Klaus H. Schmidt, Downers, all of Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 9, 1974, Ser. No. 468,324
Int. Cl. G01n *1/00*
U.S. Cl. 356—37 **12 Claims**

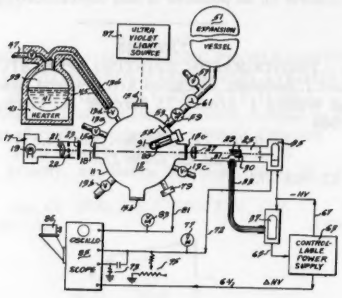
7. A method of rapidly and simultaneously determining the absolute concentration and the critical radius of condensation nuclei within a gas sample comprising:

providing said gas sample at a known temperature, pressure and humidity;

reducing the pressure of said gas sample by a monitored amount during a known time period to produce a cloud of growing condensation particles, and generating a signal representative of pressure over said time period;

passing a beam of monochromatic light through said cloud;

sensing the intensity of scattered light from said beam during said pressure reduction, and generating a signal representative of scattered light;



sensing the intensity of direct light transmitted through said cloud during said pressure reduction and generating a signal representative of direct light;

electrically generating a signal representative of light absorbance from the change in direct light intensity; and

simultaneously recording signals representative of pressure, intensity of scattered light, rate of change in scattered light, and light absorbance within said cloud during said known time period and determining the concentration and critical radius of nuclei therefrom.

3,890,047

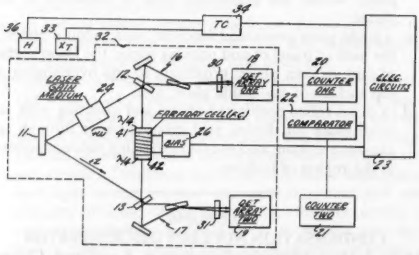
DIFFERENTIAL LASER GYRO EMPLOYING REFLECTION POLARIZATION ANISOTROPY

Richard T. Warner, Winsted, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Feb. 25, 1969, Ser. No. 802,014

Int. Cl. H01s *3/10*

U.S. Cl. 356—106 LR **1 Claim**



1. A differential laser gyro system comprising a ring laser optical cavity having an optical path including an odd number of mirrors and a laser gain medium disposed in said cavity;

a Faraday cell disposed in said optical path;

a pair of quarter wave plates disposed on opposite ends of said Faraday cell, said quarter wave plates and said Faraday cell comprising an optical path segment wholly between two of said mirrors, whereby the traveling waves incident upon each of said mirrors from either direction is plane polarized in mutually perpendicular planes;

the length of said optical cavity being chosen with respect to the line frequency of said laser gain medium so as to provide a cavity length including an integral number of wavelengths within the oscillation-sustaining frequency range of said laser gain medium in said optical cavity, whereby the frequency of electromagnetic radiation in one orientation of plane polarization differs from the frequency of electromagnetic radiation in a perpendicular sense of polarization, the parameters of said laser gyro system being chosen so that there is provided a pair of laser gyros operating in said cavity separated in frequency, each implemented in a polarization which is distinct from the other, each having a bias which is opposite to but substantially equal in magnitude to the bias of the other; and

differential read out means for providing an output proportional to the difference between outputs of the two laser gyros.

3,890,048

METHOD AND APPARATUS FOR MEASURING THE COLOR DENSITY OF PRINTING INKS APPLIED TO A MOVING WEB

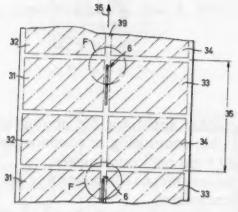
Antonio Abbondio, Lausanne, and Tino Celio, Ambri, both of Switzerland, assignors to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Oct. 30, 1972, Ser. No. 301,722

Claims priority, application Switzerland, Nov. 3, 1971, 16000/71

Int. Cl. G01n *21/18, 21/20*

U.S. Cl. 356—199 **9 Claims**



1. A method of measuring the color density of printing inks applied to a moving web of material to print multi-colored matter thereon, the method comprising;

a. printing on said web in the direction of movement thereof a plurality of colorimetric scales, each scale having a plurality of different colored zones, and each zone comprising at least three different tones of the zone color arranged in sequence on said web in the direction of web movement, a first group of synchronizing marks at one end of each said scale and a second group of synchronizing marks between zones of a scale each mark being printed in a direction transverse to the direction of web movement,

b. sensing the synchronizing marks and providing in response thereto a plurality of timing pulses each representing an incremental movement of said web, the distance between said first and second groups determining the synchronization between web travel and sensing of each of the tones in a zone,

c. sensing the color density of each tone in a zone in response to a timing pulse indicating that the zone is in a position to be sensed,

d. providing a white reference, and

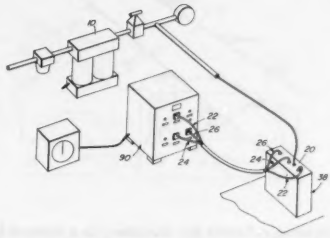
e. evaluating the density of each tone of a reference zone relative to the white reference.

3,890,049

GLOSSMETER FOR PROVIDING A LINEAR RESPONSE CORRESPONDING TO TRUE GLOSS READINGS

Donald S. Collins, Bridgton, Maine, and Patrick J. Peoples, Intervale, N.H., assignors to Howell Laboratories, Inc., Bridgton, Maine

Filed Sept. 17, 1973, Ser. No. 397,993
Int. Cl. G01n 21/18, 21/30, 21/48
U.S. Cl. 356—199 25 Claims



1. A glossmeter which comprises:

means to measure continuously the gloss of a surface of a web, and to provide a continuous electrical signal corresponding to the gloss of the measured surface;

means to define a measurement plane through which the web moves into and out of, the signals from the surface of the web corresponding to a true gloss reading when the web is in said measurement plane; and

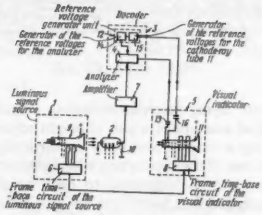
means to select for recording only those signals of the continuously transmitted signals corresponding to the value of the gloss from the surface of the web passes through the measurement plane.

3,890,050

DEVICE FOR MEASURING NONUNIFORMITY OF PHOTOPARAMETRIC CHARACTERISTICS OF MATERIALS

Vladimir Dmitrievich Kozlov, 15 Parkovaya ulitsa, 26, korpus 3, kv. 164, and Isaak Yankelevich Breido, ulitsa Kirpichnaya, 47, kv. 53, both of Moscow, U.S.S.R.

Filed Apr. 10, 1973, Ser. No. 349,811
Int. Cl. G01n 21/32
U.S. Cl. 356—237 8 Claims


Reference voltage generator unit
Decoder
Generator of the reference voltages for the analyzer
Generator of the reference voltages for the cathode-ray tube II
Analyzer amplifier
Luminous signal source
Visual indicator
Frame time-base circuit of the luminous signal source
Frame time-base circuit of the visual indicator

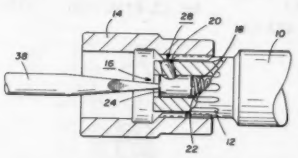
1. A device for measuring the non-uniformity of a photoparametric characteristic of a material, and in particular the non-uniformity of luminous intensity of the material comprising: a luminous signal source in said material; a frame time-base circuit of said source; a photoelectric sensor disposed across the path of luminous signals from said source and transforming said luminous signals into electrical signals corresponding to the non-uniformity of luminous intensity of said source; a visual indicator connected electrically to said photoelectric sensor to display said electric signals; a decoder with input connected electrically to the output of said photoelectric sensor, the output of said decoder being connected to the input of said visual indicator; an analyzer of said decoder and connected electrically thereto, said analyzer being adapted to select, in accordance with reference electric signals generated by said decoder, signals from the plurality of signals from said photoelectric sensor which correspond to the desired level of luminous intensity of said material; a frame time-base circuit of said visual indicator synchronized with said frame time-base circuit of said luminous signal source so that when the values of the electric signals from said photoelectric sensor correspond to those of the reference signals set by said decoder, said visual indicator displays images of regions of equal values of said characteristic of said material in the form of equally bright zones whose distribution by coordinates corresponds to that of regions of equal values of the luminous intensity of said material.

3,890,051

SOCKET RETAINER FOR ROTATABLE POWER TOOL

Paul Albert Biek, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 1, 1974, Ser. No. 447,129
Int. Cl. F16b 1/04
U.S. Cl. 403—20 12 Claims



1. In a rotary operable power tool having an output drive shank adapted to support a detachable drive socket thereon, a retainer mechanism for coupling and retaining a drive socket on said shank, said retainer mechanism comprising in combination:

a. an elastomeric plunger displaceably supported in a longitudinal bore defined within said shank; and

b. a pivotally supported elongated detent means extending through a radial bore defined in said shank from a first end communicating inward of said longitudinal bore operably engageable with and retained by said plunger to a second end adapted to protrude radially outward beyond the periphery of said shank;

c. said detent means being operably pivotal by displaceable movement of said plunger and effective when said plunger is at a first location within said longitudinal bore for its said second end to protrude radially outward beyond the periphery of said shank a sufficient distance to retain a coupled socket on said shank and effective when said plunger is at a second location within said longitudinal bore for its said second end to be displaced radially inward from said retaining distance to permit coupling and uncoupling of a drive socket to and from said shank.

3,890,052

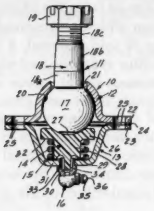
WEAR INDICATING JOINT ASSEMBLY

Edward J. Herbenar, and Sylvester S. Mazur, both of Detroit, Mich., assignors to TRW Inc., Cleveland, Ohio

Filed Apr. 16, 1973, Ser. No. 351,601
Int. Cl. F16c 11/06
U.S. Cl. 403—27 7 Claims

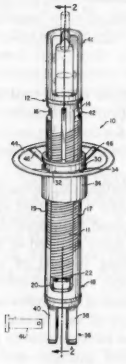
7. In a joint construction having a housing, wearable components in the housing, wear take-up means for said components, and a rigid wear indicator readable from outside of the housing, the improvement of a removable lubricant fitting threaded into the housing freely receiving the rigid wear indicator and sealing the housing while providing a lubricant passageway around the rigid wear indicator communicating

with the wearable components in the housing, and said fitting being removable from the housing to expose the rigid wear



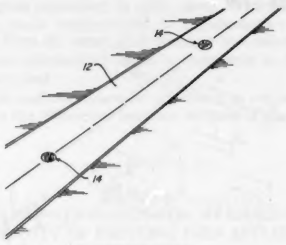
indicator for a reading of the wear conditions of the wearable components in the housing.

3,890,053
ADJUSTABLE LINK
William V. Strecker, Long Island City, N.Y., assignor to Peck & Hale, Inc., West Sayville, N.Y.
Filed June 26, 1974, Ser. No. 483,402
Int. Cl. F16b *7/06*
U.S. Cl. 403—44 **11 Claims**



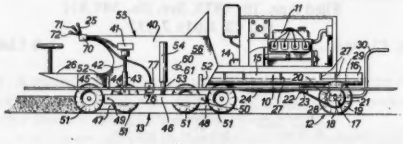
1. An adjustable link assembly which comprises:
a. a first elongated externally threaded member defining at least one longitudinally extending slot, said threads being multi-start threads;
b. a second elongated externally threaded member received within the first member and having at least one longitudinally extending externally threaded lug received within each slot of the first member in a manner such that portions of said members are in overlapping relation, said lug threads being multi-start threads substantially equal and opposite to the threads on the first member; and
c. an internally threaded sleeve embracing overlapping portions of said first and second members in threaded engagement therewith, said sleeve having at least two multi-start substantially equal and opposite internal threads mating respectively with the external threads of said first and second members such that rotation of said sleeve in a first direction results in movement of the first and second members toward each other and rotation of said sleeve in the opposite direction results in movement of said first and second members away from each other.

3,890,054
FLEXIBLE HIGHWAY MARKER
Sean E. O'Connor, 1309 Redwood Ln., Libertyville, Ill. 60048
Filed Apr. 1, 1974, Ser. No. 456,526
Int. Cl. E01f *9/00*
U.S. Cl. 404—10 **8 Claims**



1. A highway reflector for mounting in a formed highway socket, including
a base, said base having a supporting body with continuous sidewalls, at least said sidewall portions being elastomeric,
a plurality of densely grouped and relatively staggered resilient fingers extending upwardly from said supporting body, and
a reflective material associated with each of said resilient fingers.

3,890,055
CONCRETE LAYING MACHINE
William Phillip King Rochfort, Unit 9, Riverside Gardens, Carlow Street, Kedron, Hillend Brisbane, Queensland, Australia
Continuation of Ser. No. 101,405, Dec. 24, 1970, abandoned.
This application Nov. 26, 1973, Ser. No. 419,150
Int. Cl. E01c *19/52*
U.S. Cl. 404—84 **21 Claims**

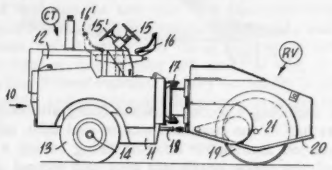


1. A concrete laying machine including a body, a pair of supporting wheel assemblies, a pair of height adjusting devices each supporting a side of the body in vertically adjustable manner above one of the supporting wheel assemblies, actuating means operatively connected to each height adjusting device and each adapted to actuate the respective device to raise or lower a side of the body relative to the wheel assembly supporting it, means for propelling the machine, a chamber in the body adapted to receive concrete and discharge it rearwardly through an outlet of the chamber to a mould adapted to shape the discharged concrete to a desired cross-sectional configuration as the machine is propelled, and sensing means on the body adapted to sense an external reference line, the sensing means being further adapted upon deviation of one or both sides of the body from a predetermined vertical relationship with the external reference line to cause the or each actuating means to be operated to raise or lower the or each side of the body to return the or each side to its predetermined relationship with the external reference line.

3,890,056
COMBINED-ACTION VIBRO COMPACTING MACHINE FOR THE CONSTRUCTION OR ROADS

Domenico Domenighetti, via Nosetto 6, 6500 Bellinzona, Switzerland

Filed Dec. 19, 1972, Ser. No. 316,578
Claims priority, application Switzerland, Dec. 28, 1971, 19098/71
Int. Cl. E01c *19/38*
U.S. Cl. 404—117 5 Claims

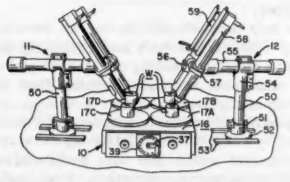


1. A combined-action vibro-compacting machine comprising a vibrating element including a metallic drum, and a compacting element or component formed by a series of pneumatic tired wheels, said two components being connected by a steering pivot link, characterized by the combination of the following features; the distance between the axis (**14**) of the tired wheels (**13**) and the axis (**21**) of the vibrating drum (**19**) does not exceed 4 m; the weight discharged on the ground through the series of pneumatic tires (**13**) being about 9.2 metric tons and the weight discharged on the ground through the vibrating drum being about 5.8 metric tons; a frame (**11**) and means mounting the pneumatic wheels (**13**) on the frame for vertical movement relative to the frame and relative to each other so that each wheel follows the contour of the ground, the pneumatic wheels (**13**) being thus each isostatically suspended to weigh on the ground with a force equal to the total weight of the tired section of the machine divided by the number of wheels; the centrifugal force of the metallic vibration drum is larger than 30% of the total weight of the combined-action machine; the width of the metallic drum is about 1.5 meters and is larger than the width of the strip compacted by the series of parallel pneumatic wheels (**13**) namely so that the drum extends beyond each of the sides.

3,890,057
MULTI-STATION DRILL APPARATUS

James J. Kindelan, Greensburg, Pa., assignor to Overmyer Mould Company of Pennsylvania, Greensburg, Pa.

Filed June 13, 1974, Ser. No. 478,922
Int. Cl. B23b *39/20*
U.S. Cl. 408—43 12 Claims



1. A multi-station apparatus for carrying out metalworking operations upon a plurality of workpieces, said apparatus comprising:

a plurality of turntables having vertical axes of rotation for supporting workpieces;

support means carrying said turntables for rotation at horizontally-spaced locations with said vertical axes lying within a vertical plane;

drive means carried by said support means for rotating said turntables simultaneously about said vertical axes;

indexing means for locking said turntables at a desired position after rotation by said drive means;

a support column extending vertically above said turntables and horizontally spaced therefrom;

a radial arm extending from said support column toward said vertical plane;

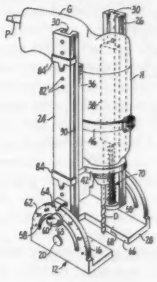
tool means carried by said radial arm for each of said plurality of turntables; and

means for displacing said tool means in a direction toward said turntables for performing spaced machining operations upon each workpiece while supported by the turntables.

3,890,058
DRILL GUIDING APPARATUS

Edgar L. Self, Fremont, and John C. Gormley, Dixon, both of Calif., assignors to Rhodes Investment Company, San Jose, Calif.

Filed Nov. 1, 1973, Ser. No. 411,690
Int. Cl. B23b *45/14*
U.S. Cl. 408—112 7 Claims



1. Apparatus for guiding a powered hand drill along a path toward and away from the surface of a work piece, said drill being of the type having a housing, a motor in the housing, and a tool gripping chuck exterior of the housing and in driven relation to the motor, the chuck being driven by the motor about a drilling axis, said apparatus comprising a base having a lower surface for contacting the surface of the work piece, first and second elongate guide bars extending upward from said base, means for mounting said guide bars to said base in parallel, spaced-apart relation on opposite sides of said path, first and second slides supported for movement along said guide bars toward and away from said base, a drill support member attached to said slides and spanning the space therebetween, said drill support member defining an opening for affording extension of said chuck therethrough, said support member having a portion bounding said opening for engaging the housing adjacent the chuck, means spaced from said support member for securing said housing at a site remote from the chuck to said slides, said support member and said securing means being adapted to mount said drill so that the drilling axis is parallel to the path, said base defining a passage therethrough in alignment with the drilling axis so as to permit a tool in the chuck to contact the work piece in response to movement of said drill along the path, means extending inward from said guide bars for defining abutments at the ends of said guide bars adjacent said guide bar mounting means, said slides having end faces confronting said abutments, a pair of compression springs for resiliently biasing said slides away from said base, one of said springs being disposed between one of said abutments and the end face of the slide confronting

said abutment and the other of said springs being disposed between the other of said abutments and the end face of the slide confronting said other abutment, a rigid rod disposed within each of said springs for supporting the spring, each said rod having a lower end secured to the abutment opposed to the spring within which the rod is disposed, said slides each having a longitudinal opening in alignment with the rod disposed in the spring opposed thereto, in which opening said rod slides in response to movement of said slides toward and away from said base.

3,890,059

HYDRAULIC TURBINE OPERATING METHOD AND APPARATUS

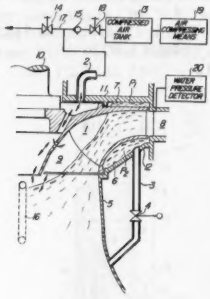
Mituo Takase, Mito, Japan, assignor to Hitachi, Ltd., Japan

Filed Oct. 23, 1973, Ser. No. 408,260

Claims priority, application Japan, Oct. 25, 1972, 47-106287; Mar. 7, 1973, 48-26034

Int. Cl. F01d *17/00*

U.S. Cl. 415—1 **7 Claims**



1. An method of operating a hydraulic turbine in which the operating pattern of the hydraulic turbine is switched from a normal running to a spinning reserve, the method comprising: supplying air into a runner chamber of the hydraulic turbine, discharging water leakage from guide vanes of the hydraulic turbine, and controlling the air supply and the discharging of water leakage so that the relation between thrusts on upper and lower sides of a runner of the hydraulic turbine will be substantially the same as that in the normal running condition.

3,890,060

ACOUSTIC DUCT WITH ASYMMETRIC ACOUSTICAL TREATMENT

Norman J. Lipstein, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 15, 1974, Ser. No. 442,893

Int. Cl. F01d *25/00;* **F01n** *7/00*

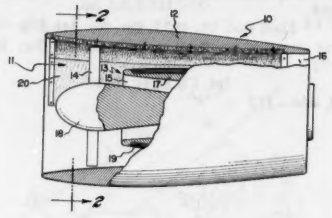
U.S. Cl. 415—119 **6 Claims**

1. An improved noise-suppressing fan duct for an aircraft jet engine having a fan disposed within an annular fan duct air passage comprising

a generally streamlined rigid fan duct with a circular cross section having an asymmetric, circumferentially discontinuous acoustic lining attached to the inner surface thereof for absorbing noise which radiates within said duct,

said asymmetric acoustic lining being located on the upper portion of the circumference of said duct and being effective to alter the directivity of noise emitted from an end of said fan duct and produce an asymmetric directivity pattern characterized by preferential enhanced suppression of noise in an angular sector generally below the jet engine,

wherein said asymmetric acoustic lining is approximately semicylindrical and is continuous and uninterrupted in both the axial and circumferential directions, and



further including a second acoustic lining attached to the lower half of the circumference of said duct, said first-mentioned asymmetric acoustic lining having a higher sound absorption coefficient than said second acoustic lining.

3,890,061

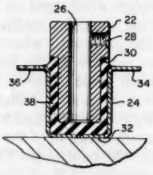
RESILIENT HUB ASSEMBLY

Jacek A. Nechay, Avon, Conn., assignor to Torin Corporation, Torrington, Conn.

Filed Jan. 2, 1974, Ser. No. 429,570

Int. Cl. F04d *29/20*

U.S. Cl. 416—134 **4 Claims**



1. An air impeller comprising:

a plurality of circumaxially arranged air moving blades,

at least one generally radially extending outer blade support member connected at a radially outwardly located portion with said air moving blades and adapted at a radially inwardly located area for connection with a hub assembly,

a hub assembly comprising first and second rigid hub members respectively in driving and driven relationship with each other and the latter of which has an inner blade support member integral thereon and in the form of an annular radial flange drivingly connected at a radially outwardly located portion with said radially inwardly located area of said radially extending outer blade support member,

said driven hub member also having an annular axially extending wall integral with and extending from said flange and a radially extending end wall integral with said annular axial wall, said hub member thus taking a flanged-cup configuration,

said driving hub member being adapted to be mounted on and driven by a suitable shaft and having a first cylindrical section disposed within and with peripheral side and radial end walls spaced respectively from said annular axial and radial end walls of said driven hub member,

said driving member also having an enlarged second cylindrical section integral with said first cylindrical section and spaced axially outwardly from said annular flange whereby to define an annular shoulder extending radially outwardly and facing axially toward said flange on said driven hub member,

and said hub assembly also comprising an intermediate and resilient hub member having a cup-shape and connected in driving relationship between said driving and driven hub members,

said resilient hub member comprising a molded in situ elastomer with an annular cup side wall disposed between and bonded to said annular and axially extending wall of said driven hub member and said peripheral side wall of said driving hub member,

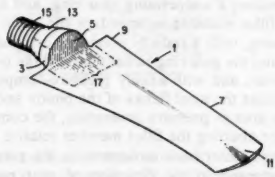
and a radial cup end wall disposed between and bonded to said radially extending end wall of said driven hub member and said radial end wall of said driving hub member, and said annular cup side wall also projecting axially beyond said axially extending annular side wall of said driven hub member and being bonded to said radial shoulder on said driving hub member with an annular portion thereof exposed radially outwardly between said shoulder and said annular flange on said driven hub member.

3,890,062

BLADE TRANSITION FOR AXIAL-FLOW COMPRESSORS AND THE LIKE

Donald E. Hendrix; Richard E. Ziegler, both of Oakridge, Tenn., and Weldon E. Swinson, Auburn, Ala., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 28, 1972, Ser. No. 266,900
Int. Cl. F04d *29/38*
U.S. Cl. 416—234 **5 Claims**



1. In a finished axial-flow gas machine blade including a platform and an airfoil extending therefrom, a face of said airfoil merged with a surface of said platform via a transition disposed entirely in the fillet region of said airfoil, the said transition defining in profile a line consisting of (a) an essentially straight major segment sloping outwardly from said face and toward said surface, the slope of said major segment having a value providing an essentially constant applied-moment-to-section-modulus ratio along the length thereof, and (b) an outwardly concave minor segment faired into said surface, said minor segment being substantially superimposable on a quadrant of an ellipse.

3,890,063

COMPRESSOR START AND WARM-UP CONTROL SYSTEM

Arthur R. Spafford, Holyoke, Mass., assignor to Worthington-CEI, Incorporated, Holyoke, Mass.

Filed Nov. 16, 1973, Ser. No. 416,357
Int. Cl. F01b *49/00*
U.S. Cl. 417—27 **10 Claims**

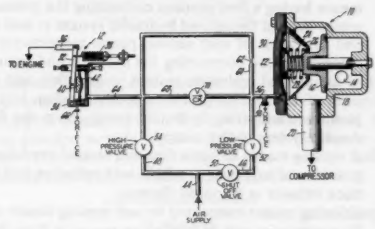
1. A start and warm-up control for an engine driven compressor including:

means for controlling the delivery of gas to a compressor;

means for controlling the speed of an engine driving the compressor;

first supply line means connected to said gas delivery control means and to said speed control means, said first supply line means including first pressure responsive means responsive to a first level of compressor discharge pressure during a warmup period for delivering first signal pressure to both said gas delivery control means and said speed control means for controlling gas flow to the compressor and for reducing engine speed to a first control valve below full speed but above idle speed, said first supply line means including pressure reducing means for reducing the pressure of said first signal to said speed control means below the pressure to said gas delivery control means; and

second supply line means connected to said speed control means and to said gas delivery control means, said second



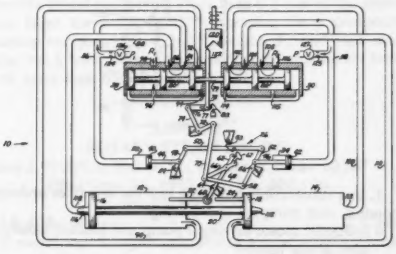
supply line means including second pressure responsive means responsive to a second level of compressor discharge pressure during normal operation for delivering a signal pressure to both said gas delivery control means and said speed control means for controlling gas flow to the compressor and reducing engine speed to a second control value, said second level of compressor discharge pressure being higher than said first level of compressor discharge pressure and said second control value of engine speed being lower than said first control value of engine speed, said first and second supply line means being interconnected at a point downstream of said pressure reducing means in said first supply line means.

3,890,064

RECIPROCATING TRANSFER PUMP

Wilfred E. Boehringer, Fullerton; Jane Little, Long Beach; Robert D. Rothi, Rolling Hills, and Charles G. Westlund, Long Beach, all of Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Jan. 11, 1973, Ser. No. 322,615
Int. Cl. F04b *41/04*
U.S. Cl. 417—237 **11 Claims**



1. A motor pump for transferring hydraulic energy between first and second hydraulic systems, said motor pump including:

first and second hydraulic cylinders including first and second pistons each having first and second sides, and connecting means connected between the second sides of said first and second pistons;

first control valve means connected between the pressure and return lines of the first hydraulic system and said first hydraulic cylinder, said first control valve means having a first position connecting the pressure and return lines of the first hydraulic system to said first and second sides of said first piston respectively and a second position connecting the pressure and return lines of the first hydraulic system to said second and first sides of said first piston respectively when said motor pump is transferring hydraulic energy from the first hydraulic system to the second;

a second control valve means connected between the pressure and return lines of the second hydraulic system and said second hydraulic cylinder, said second control valve means having a first position connecting the pressure and return lines of the second hydraulic system to said second and first sides of said second piston respectively and a second position connecting the pressure and return lines of the second hydraulic system to said first and second sides of said second piston respectively when said motor pump is transferring hydraulic energy from the first hydraulic system to the second;

first sensing means to sense first and second predetermined positions of said pistons within said cylinders and to produce outputs in response thereto;

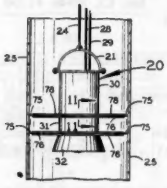
positioning means connected to said sensing means outputs for positioning said control valve means in their first and second positions in response to the predetermined positions of said pistons; and

second sensing means connected to the first and second hydraulic system to sense which system needs hydraulic energy transferred to it, said second sensing means including reversing means connected to said first and second control valve means, said reversing means reversing the connections between said first and second control valve means and said first and second hydraulic cylinders when the need is sensed by said sensing means so hydraulic energy is transferred to the system in need.

3,890,065
SUSPENDED SUBMERSIBLE PUMPING UNIT

J. Marlin Eller, 204 N.E. 8th Ter., and J. David Eller, 281 S.E. 18th Ave., both of Deerfield Beach, Fla. 33441

Division of Ser. No. 376,883, July 5, 1973. This application Aug. 5, 1974, Ser. No. 494,776
Int. Cl. F04b *17/00*
U.S. Cl. 417—360 7 Claims



1. In a submersible pumping unit for use at an underground conduit, said pumping unit having

a hydraulic motor driving a pump and located axially at one side of the pump,

an annular casing extending circumferentially around said motor and said pump, said casing being substantially smaller in cross-section than the underground conduit,

means supporting said motor and said pump inside said casing,

and suspension means attached to said casing for supporting the assembly of said casing and said motor and pump from above,

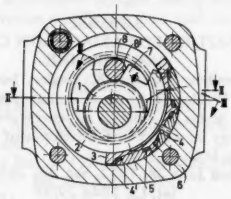
the improvement which comprises:

an annular rigid support plate attached to said casing and extending outward from said casing an appreciable distance laterally around the circumference of said casing, and an annular, flat, flexible and resilient sealing ring secured to said support plate and extending laterally outward therefrom around the entire circumference of said casing for wiping engagement with the inside of the conduit.

3,890,066
AXIALLY AND RADIALLY COMPENSATED HIGH PRESSURE GEAR PUMP

Otto Eckerle, Benzstrasse 6, 7502 Malsch, Germany

Filed Mar. 18, 1974, Ser. No. 452,282
Claims priority, application Germany, Mar. 16, 1973, 2313085
Int. Cl. F02c *21/00*; F01c *1/10*, *19/02*
U.S. Cl. 418—71 10 Claims



1. In a high pressure gear pump of the internally-geared type having a pinion, a cooperating gear ring, and a radially displaceable filler member arranged in the main bore of the pump housing, with a radially pressure-compensated control piston biasing the gear ring radially toward the pinion and the filler member, and with axially pressure-compensated discs bearing against the axial flanks of the pinion and gear ring in at least the area of pressure generation, the combination of:

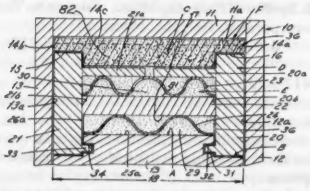
means for abutting the filler member relative to the pump housing against back movement in the rotational direction opposed to the direction of gear rotation, while permitting a small radial displacement of the filler member; and

mechanical spring-biasing means engaging the filler member for biasing the latter toward said abutting means in said abutment direction, while permitting said radial displacement of the filler member.

3,890,067
RUBBING SEAL SYSTEM FOR A ROTARY COMBUSTION ENGINE

Vemulapalli D. N. Rao, Woodhaven, and Yeshwant P. Telang, Grosse Ile, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 24, 1973, Ser. No. 391,375
Int. Cl. F01c *19/02*; F04c *27/00*; F01c *21/00*
U.S. Cl. 418—121 19 Claims



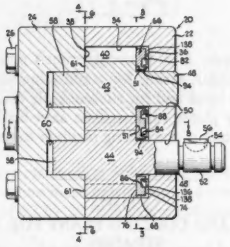
1. A sealing element carried by a rotor in a rotor housing of a rotary internal combustion engine comprising:

a. a wear-resistant body comprised of a composition which will maintain high hardness at elevated temperatures and contains volatile impurities,
b. a plurality of separated embedments disposed in said body and adjacent to at least one surface of said body which is adapted for frictional engagement with said rotor housing, the embedments being comprised of a material effective to be distributed across major portions of said one surface under the influence of frictional forces and effective, when so distributed to pack the pores of said body to prevent non-uniform loss of said impurities, said embedments being arranged so that the distributed material can be replenished during successive wear cycles of the body.

3,890,068
SEALING ARRANGEMENT FOR A FLUID PRESSURE DEVICE

Robert R. Davidson, Wooster, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed June 28, 1973, Ser. No. 374,290
Int. Cl. F01c *19/08;* **F03c** *3/00;* **F04c** *15/00*
U.S. Cl. 418—132 **5 Claims**



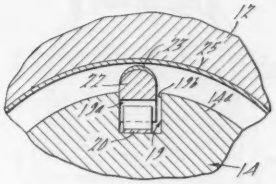
1. A pressure-loaded seal member for a rotary fluid-pressure energy-translating device of the positive displacement type, formed of resilient material and comprising first and second sealing walls generally normal to each other and disposed about a centroidal curve lying in a single plane, the first sealing wall having a planar first sealing surface disposed outwardly relative to the curve and parallel with the plane thereof, the second sealing wall having a second sealing surface disposed outwardly relative to the curve and intersecting the plane thereof at a locus of points equidistant therefrom, the sealing walls being joined to each other at a common edge thereof and each having a free edge opposite the common edge, and a plurality of preloading elements projecting from the free edge of the first sealing wall in transverse directions relative thereto and in spaced relation to each other, each of the preloading elements having an outer surface coplanar and contiguous with the first sealing surface, and a preloading surface generally normal to the outer surface and extending therefrom toward the plane of the curve.

3,890,069
COATING FOR ROTARY ENGINE ROTOR HOUSINGS AND METHOD OF MAKING

Yeshwant P. Telang, Grosse Ile, and James C. Uy, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed July 5, 1973, Ser. No. 376,862
Int. Cl. F04c *1/08*
U.S. Cl. 418—178 **12 Claims**

1. A wear and chatter resistant coating system for the rotor housing of a rotary internal combustion engine, the system comprising:
a. a support portion comprised of a material having a thermal conductivity factor at least equivalent to aluminum, and
b. an outer exposed portion comprised of an admixture of generally equally hard powder particle types, one type

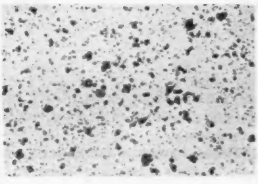


comprising martensitic stainless steel and the other type comprising a nickel-based alloy, said powder particles being surface fused to form a coating network, said starting powder particle types are uniformly limited to less than 200 mesh for providing an improvement in machined smoothness of said exposed portion.

3,890,070
RELATIVE COMBINATION OF AN APEX SEAL AND A ROTOR HOUSING IN THE ROTARY ENGINE

Takao Sasame, Hiroshima; Kentaro Takahashi, Saitama; Yoshikatsu Nakamura, Kanagawa, and Kazumasa Miura, Saitama, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Aug. 3, 1973, Ser. No. 385,266
Claims priority, application Japan, Aug. 3, 1972, 47-77286
Int. Cl. F01c *21/08*
U.S. Cl. 418—178 **1 Claim**



1. A combination of an apex seal and a rotor housing in a rotary engine, wherein said apex seal is made from ferrous or nonferrous metal and having more than 0.1 mm of the sliding surface layer thereof formed by spraying Fe-O compound containing oxygen 15.0 – 30.05 weight %, and said rotor housing has a hard plated sliding surface having the Hv hardness of more than 650.

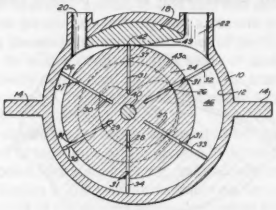
3,890,071
ROTARY STEAM ENGINE

William J. O'Brien, Judson St., Raynham, Mass. 02767

Filed Sept. 24, 1973, Ser. No. 400,136
Int. Cl. F01c *1/00*
U.S. Cl. 418—260 **2 Claims**

1. A rotary steam engine comprising a substantially circular housing, an intake passage and an exhaust passage through said housing, a header plate mounted in said housing with an inner surface extending substantially on a chord of the circular housing, spaced intake and exhaust passages at opposite ends of the header plate, a cylindrical rotor eccentrically mounted in said housing to have a point of tangency at a point removed from the center of said header plate and closer to the intake passage than the exhaust passage, a shaft passing through the

axis of said cylindrical rotor, the axis of said rotor located below a plane passing through the horizontal axis of said housing, a plurality of vanes reciprocally mounted in said

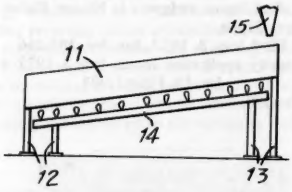


rotor, stationary cam means located within the housing engaging the radially inner end of said vanes, said vanes contacting the housing or the header plate throughout.

3,890,072
APPARATUS FOR FORMING SOLID SPHERICAL PELLETS

Ronald E. Barks, Thompson, Conn., assignor to Norton Company, Worcester, Mass.

Filed Sept. 4, 1973, Ser. No. 393,757
Int. Cl. B22f *9/00*
U.S. Cl. 425—6 **9 Claims**



1. An apparatus for forming substantially spherical solid pellets from droplets of a slurry of finely divided solid aluminous particles comprising

a supporting means having a continuous smoothly contoured upper surface extending between a relatively higher upper end and a relatively depressed lower end thereof exposed along its entire length to the ambient pressure of a normal atmospheric environment, and

a means for depositing droplets of said slurry upon the upper surface of said supporting means

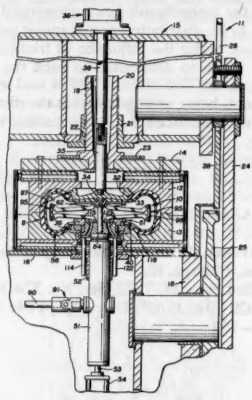
a drying means disposed adjacent to said supporting means and operative upon said droplets adjacent to the upper end of said supporting means so as to convert said droplets to dry relatively hard pellets by the time they slide down the upper surface of said supporting means to its lower end.

3,890,073
CENTER MECHANISM FOR A PRESS TO SHAPE AND CURE TIRES

Gary R. Getz, Norton, Ohio, assignor to McNeil Corporation, Akron, Ohio

Division of Ser. No. 185,931, Oct. 4, 1971, Pat. No. 3,790,656. This application Dec. 5, 1973, Ser. No. 422,027
Int. Cl. B29h *5/02*
U.S. Cl. 425—48 **11 Claims**

1. In a press for shaping and curing tires, a center mechanism comprising, a flexible bladder over which an uncured tire band having a transverse plane of structural symmetry is receivable, opposed axially movable hubs with said bladder secured thereto, opposed bearing plates disposed within said bladder, link arms connecting said bearing plates to said hubs for displacing said bearing plates radially outwardly upon axial movement of said hubs toward each other to effect the application of mechanical pressure against the uncured tire band

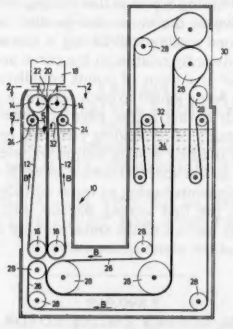


and thereby support it in a predetermined position with respect to said bladder, means for conforming said bladder to the uncured tire band and for subsequently disengaging said opposed bearing plates from against said bladder to allow unrestricted contact of the curing medium to the full surface of said bladder.

3,890,074
EXTRUSION AND COOLING PLANT FOR PLASTICS STRANDS

Rudolf Paul Fritsch, Goslarer Strasse 58, 7 Stuttgart 58, Germany

Filed Apr. 17, 1973, Ser. No. 351,866
Claims priority, application Germany, Apr. 22, 1972, 2219786; July 10, 1972, 2233917
Int. Cl. B29c *25/00*
U.S. Cl. 425—71 **9 Claims**



1. Apparatus for extruding and cooling plastic strands comprising a tank for liquid coolant, a die head provided with at least two rows of downwardly facing apertures from which a plurality of plastic strands are to be simultaneously extruded, the apertures of each row being offset with respect to the apertures of an adjacent row, and a pair of endless conveyor belts arranged in abutting face-to-face relationship over at least a portion of their respective lengths to define an inlet funnel below said die head for receiving strands extruded

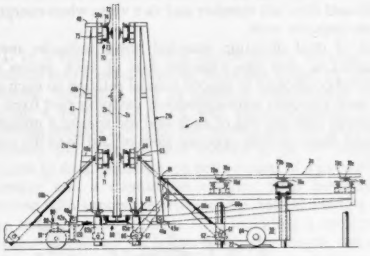
therefrom and for transporting them into a coolant in said tank, the facing surfaces of said conveyor belts being provided with longitudinally extending ribs, the ribs of one of the pair of belts being laterally offset with respect to the ribs of the other said pair of belts, each rib of one belt defining with the space between a pair of ribs of the other belt a duct extending longitudinally of said pair of belts for transporting a single extruded plastic strand.

3,890,075

TRANSFER MECHANISM FOR STRUCTURAL MEMBERS

John Lorin Bourdo, Phoenix, Ariz., assignor to Automated Construction Industries, Inc., Phoenix, Ariz.

Filed Feb. 25, 1974, Ser. No. 445,249
Int. Cl. B29c *3/02*
U.S. Cl. 425—88 **10 Claims**



3. A transfer mechanism for joining and transporting pairs of mating structure mold halves having dimensions as large as in the order of 12 by 20 feet, said mechanism comprising:

a main frame;

a pair of swing frames pivotally carried by the main frame on adjacent parallel axes and adapted in horizontal positions thereof to receive respective ones of said mold half pairs and adapted in vertical positions thereof to hold the mating mold halves in engagement with each other between the swing frames to permit clamping of the mold halves together;

means connected to the main frame and to the swing frames for moving the swing frames between said horizontal and vertical positions, and

conveyor means carried by the main frame between the swing frames for supporting the mating mold halves when the swing frames are in their vertical positions.

3,890,076

DEVICE FOR THE SEALING OF A BLOCK FORMED OF A PILE OF PLATES, SUCH THAT OF FUEL CELL, WHILE MAINTAINING FREE PASSAGEWAYS BETWEEN THESE PLATES

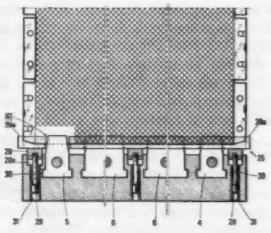
Yves Breelle, Le Pecq; Alain Grehier, Paris, and Marcel Paty, Les Essarts Le Roi, all of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, France

Filed Jan. 24, 1973, Ser. No. 326,548
Claims priority, application France, Jan. 31, 1972, 7203220
Int. Cl. B29c *1/00*
U.S. Cl. 425—110 **8 Claims**

1. A removable casting device for sealing at least the periphery of a block of piled adjacent plates maintained in spaced relationship to one another during casting, said device comprising:

separating means for insertion between the adjacent plates in such a manner to provide fluid flow passageways between sealed adjacent plates in use,

an assembly for arranging said piled adjacent plates in piled relationship comprising removable base plate means, and at least one removable side wall means for positioning said separating means between the adjacent plates, said sidewall means having extracting means for separating said block from said separating means and said at least



one side wall means after casting to form the fluid flow passages, and

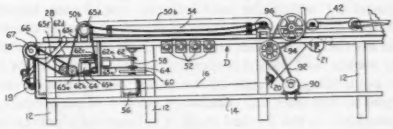
retaining means for retaining said separating means on said at least one side wall means.

3,890,077

APPARATUS FOR MANUFACTURING ARTIFICIAL BOARDS AND SHAPES

John A. Holman, 1206 Rutledge Way, Anderson, S.C. 29621

Filed Jan. 5, 1973, Ser. No. 321,153
Int. Cl. B29c *15/00*
U.S. Cl. 425—111 **8 Claims**

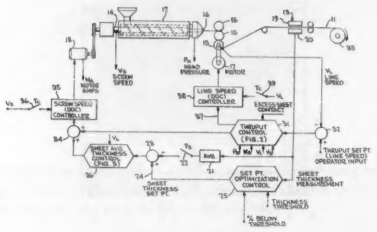


1. An apparatus for producing elongated articifial boards from a mixture of filler material and thermosetting resin reinforced with elongated reinforcing members comprising: a plurality of elongated endless belts radially spaced about a longitudinal axis, rotatable members supporting each of said belts in an extended loop, said belts being positioned about said longitudinal axis so that the inner surfaces of each of said belts cooperate to define an elongated forming die with an entrance opening at one end and an exit opening at the other end, said elongated forming die having a decreasing cross sectional area from adjacent said entrance opening to an intermediate portion thereof, means for supplying said mixture of filler material and thermosetting resin to the entrance of said elongated forming die, means for feeding said elongated reinforcing members to said elongated forming die, heaters carried closely adjacent said inner surfaces of said belts, and means for rotating said belts for compressing said mixture as said mixture is pulled through said decreasing cross sectional area of said forming die and for pulling said mixture and said elongated reinforcing members through said elongated die forming an elongated reinforced cured artificial board.

3,890,078
NONINTERACTING EXTRUDER CONTROL

Maris A. Straumanis, Columbus, Ohio, assignor to Industrial Nucleonics Corporation, Columbus, Ohio

Filed Jan. 31, 1972, Ser. No. 222,103
Int. Cl. B29f 3/06
U.S. Cl. 425—141 26 Claims



1. In combination with apparatus for controlling an industrial product forming machine responsive to a supply of input material, first means for feeding the material to the machine, second means for taking the product formed by the machine away from the machine, both said first and second means being capable of affecting a thickness or weight property and throughput of the product formed by the machine, means for measuring the property of the formed product, means responsive to the property measuring means for comparing the measured property value with a set point for the property value to derive a first error signal, means for measuring the throughput of the machine, means for comparing the measured throughput with a set point value for throughput to derive a second error signal, means responsive to the first error signal for deriving another signal indicative of the amount by which the rate of one of the first or second means should be changed due to the property comparison, means responsive to the second error signal for deriving a further signal indicative of the amount by which the rate of said one means should be changed due to the throughput comparison, means combining said another and further signals for controlling the rate of said one means, and means responsive to said second error signal for controlling the rate of the other of the first or second means so that interaction between control of the property and throughput in the formed sheet is substantially prevented.

3,890,079
AUTOMATIC MACHINE FOR BENDING AND FLARING QUANTITIES OF PLASTIC PIPE

Willard C. Slater, Miami, Fla., assignor to Universal Plastic Pipe Bending Corporation, Miami, Fla.

Filed Nov. 13, 1972, Ser. No. 305,856
Int. Cl. B29c 17/02
U.S. Cl. 425—155 6 Claims

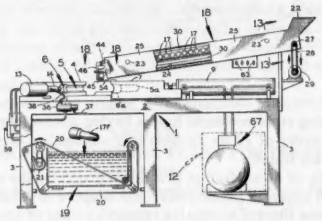
1. A machine for automatically and sequentially forming quantities of straight pre-heated softened thermal plastic round pipe of uniform predetermined dimensions into elbows having an integral expanded coupling at each end thereof comprising means forming a frame including a substantially horizontal top,

a fixed forming die member secured to said top and having a convex arcuate end surface of predetermined curvature, said end surface having a uniform recessed convex arcuate groove of predetermined axial length and a semicircular cross section with the radius thereof substantially equal to the radius of curvature of the outside diameter of the pipe being formed and each opposite end of said arcuate groove terminating in a coaxial semi-cylindrical cavity of predetermined length and having a second cross sectional radius substantially equal to the radius of the outside diameter of the pipe plus the double thickness of the wall of the pipe,

a movable forming die member having a concave end in close mating contact with said convex end of said fixed die member and a concave second groove therein mating said convex groove in said fixed die member and a like semi-cylindrical cavity at opposite ends of said second groove mating each said semi-cylindrical cavity in said fixed die member when said movable die member is in closed mating contact with said fixed die member,

said movable die member secured to said top by slidable means for movement from closed contact with said fixed die member to a predetermined idle position a spaced distance therefrom by connection to the piston rod of a dual direction first power cylinder means for moving said movable die member from said idle to said mating contact with said fixed die member and vice versa when energized from opposite ends,

a pair of dual direction mandrel power cylinder means secured to said top with the axis of each piston rod thereof positioned in spaced coaxial relation to each axis of each opposite semi-cylindrical cavity in said fixed die member with the end of each said rod spaced a predetermined distance from opposite sides of said fixed die member,



a cylindrical forming mandrel means secured coaxial to the end of each said piston rod of said mandrel cylinder means with a coaxial tapered outer end portion terminating in a second pilot cylinder having a chamfered end for entry into the inside diameter of said pipe when each said mandrel means is moved by each said cylinder when energized into each opposite said cylindrical cavity formed by the said semi-cylindrical cavities when said movable die member is in closed position,

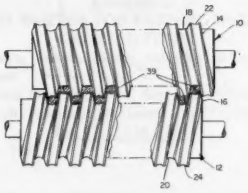
a coaxial bore of predetermined distance in the end of each said mandrel means with a connection to a flexible conduit for sequentially conducting pressurized air for reducing deformations in said elbow and followed by conducting pressurized cooling water in the rear portion thereof for partial rigidizing of the formed elbow prior to the reverse energizing of each said mandrel cylinder means,

a pipe arresting ledge having a substantially horizontal planar upper surface of predetermined width extending outward a predetermined distance from said concave end of said movable die member with said upper surface movable in a plane in close proximity with the lower edge of said groove in said fixed die member adapted for forward movement by said movable die member to arrest each descending pre-heated pipe of predetermined length in the space between the said mating ends of said fixed die member and said movable die member when the latter is spaced from the former for the movement of said pipe into its elbow form when said movable die member is moved to its said closed position.

3,890,080
ROLL-PELLETIZER FOR MAKING UNIFORM PARTICLE SIZE PELLETS

Ronald F. Cotts, Norristown, Pa., assignor to IU Conversion Systems, Inc., Philadelphia, Pa.

Filed Jan. 22, 1974, Ser. No. 435,452
Int. Cl. B29c *15/00*
U.S. Cl. 425—363 **8 Claims**

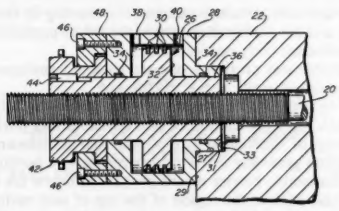


1. In a roll pelletizer for compressively forming a plastic material into formed strips of indefinite length by passing said material through a pair of opposed compressive rolls each having a yieldable surface with circumferential lands and grooves, the lands of each roll mating with the grooves of the opposed roll, wherein said formed strips are subsequently broken to form pellets, each roll consists of a cylindrical base member and a continuous resilient strip helically wound thereon with successive wraps of the helical winding abutting one another, said resilient strip including a reduced depth portion in part of its width along the length thereof, said reduced depth portion defining grooves and the remaining portion of said resilient strip defining lands on the surface of said roll.

3,890,081
INJECTION HOLDING MACHINE CLAMP MECHANISM

Volker R. Grundmann, Glastonbury, Conn., assignor to Litton Industrial Products, Inc., Berlin, Conn.

Continuation of Ser. No. 168,042, Aug. 1, 1971, abandoned. This application July 30, 1973, Ser. No. 383,778
Int. Cl. B29f *1/00*
U.S. Cl. 425—450.1 **20 Claims**



1. In a plastic injection molding machine carrying first and second sections of a mold having engaging portions the combination which comprises:

a. A base;

b. A stationary platen fixed on said base in upstanding relationship, said stationary platen carrying the first section of the mold;

c. A clamp housing carried on said base in upstanding relationship and movable on said base toward and away from said stationary platen;

d. A movable platen carried on said base in upstanding relationship and disposed between said stationary platen and said clamp housing, said movable platen being selectively movable toward and away from said clamp housing and said stationary platen and said movable platen carrying the second section of the mold for selective engagement with the first section of the mold;

e. A plurality of elongated tie bars carried by said clamp housing, said stationary platen and said movable platen, said tie bars engaging said stationary platen to prevent movement of said tie bars through the stationary platen, said tie bars slidingly engaging said movable platen to allow relative longitudinal movement therebetween;

f. A plurality of pistons and cylinders carried by said clamp housing with each of said cylinders in fixed relationship thereto, each piston having internal threads engaging corresponding threads on one of said tie bars so that rotating all of said pistons varies the mold height of the injection molding machine and application of hydraulic pressure to all of said pistons in one direction causes clamping of the mold;

g. Means for traversing said movable platen with respect to said clamp housing along the upper surface of said base;

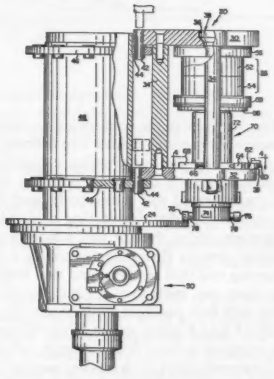
h. Blocking means for limiting relative movement of said movable platen toward said clamp housing; and

i. Drive means for simultaneously rotating each of said pistons equal angular increments to vary the mold height of the injection molding machine.

3,890,082
INJFCTION MOLDING APPARATUS

Richard H. Daly, Wood Dale; Robert V. Brink, Carpentersville, and Kare Andersen, Elgin, all of Ill., assignors to Chicago Rawhide Manufacturing Company, Elgin, Ill.

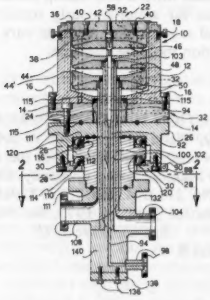
Division of Ser. No. 216,094, Jan. 7, 1972, Pat. No. 3,746,491. This application June 11, 1973, Ser. No. 368,996
Int. Cl. B29c *3/02*
U.S. Cl. 425—451.9 **8 Claims**



1. A molding station having a pair of spaced apart opposed frame members connected to each other by a frame support, first and second mold support parts arranged for movement relative to each other between open and closed positions, said mold support parts being disposed between said frame members, at least one of said mold support parts, in the closed position thereof, being supported by one of said frame members, a column assembly having a part supporting one of said mold support parts and being movable along a given axis with respect to one of said frame members, said column assembly including inner and outer elements relatively movable axially of each other and normally biased apart by resilient means, lock-receiving means in one of said inner and outer elements, a lock unit having a portion thereof movable relative to and supported by one of said frame members, said lock-receiving means being arranged so as to receive said lock therein only in a position of one of said inner and outer elements wherein said resilient means is at least partially compressed, whereby

a predetermined locking force may be applied through said resilient means to said mold support parts to lock said mold support parts into the closed position thereof by locking one of said column elements with respect to said one frame member.

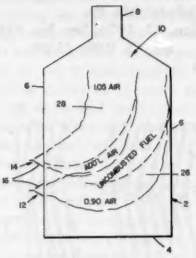
3,890,083
EXTRUSION DEVICES
Daniel Robert St. Eve, Thornhill, Ontario, Canada, assignor to Leco Industries Limited, St. Laurent, Quebec, Canada
Filed May 30, 1973, Ser. No. 365,200
Int. Cl. B29f *3/00*
U.S. Cl. 425—462 **16 Claims**



1. A rotatable coextrusion die comprising an outer die body and feeding means for feeding at least two sources of extrudable material, said outer die body having a common annular flow path terminating in a die lip, a plurality of material spreading members located within said body, each such member being comprised of a die-plate having a plurality of flow passages on opposite sides thereof and which communicate with said common annular flow path to provide a continuous flow of overlapping material streams, and said feeding means comprising at least two individual feeding means and each communicating with flow passages associated with one of said die-plates, each of said feeding means being adapted to feed an extrudable material to said flow passages, whereby all of the extrudable materials from each feeding means is combined to form a multi-layered extrudable material.

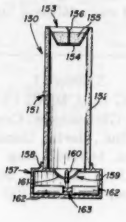
3,890,084
METHOD FOR REDUCING BURNER EXHAUST EMISSIONS
Temple S. Voorheis, Atherton, and Ralph R. Vosper, San Jose, both of Calif., assignors to Coen Company, Inc., Burlington, Calif.
Filed Sept. 26, 1973, Ser. No. 400,774
Int. Cl. F23m *3/04*
U.S. Cl. 431—10 **16 Claims**

1. A method of operating an existing industrial furnace at a low NO_x emission level, the furnace including at least two vertically spaced burners, the method comprising the step of modifying the combustion process in the furnace with the steps of firing at least a portion of one of the burners with an off-ratio air supply, firing at least a portion of the other burners with a sufficient additional air supply to provide for a low excess air firing of all burners, and combusting all fuel discharged by the burners by first combusting a portion of the



fuel adjacent the burner and thereafter combusting another portion of the fuel at a location spaced from the burners.

3,890,085
ILLUMINATED CANDLE STRUCTURE
Frits J. Andeweg, 7737 Royal Ln., Dallas, Tex. 75230
Continuation-in-part of Ser. No. 212,107, Dec. 27, 1971, Pat. No. 3,761,702. This application Sept. 24, 1973, Ser. No. 400,203
Int. Cl. F23q *2/32*
U.S. Cl. 431—125 **14 Claims**



1. In a candle structure adapted for burning in the upper portion and for illumination within the lower portion:
a translucent body portion;
a burnable wax portion supported by said translucent body portion generally at the top thereof;
wick means imbedded within said burnable wax portion and extending from the top of said burnable wax portion;
a cavity of substantial size within said translucent body portion generally below said burnable wax portion;
non-flammable barrier means positioned below the bottom of said wick in the region of the top of said cavity;
said translucent body portion substantially surrounding said cavity;
said cavity being of sufficient size and shape and being positioned to receive light for internal illumination of substantially the entire translucent body portion from a light source independent of said wick means at the top of the candle structure;
a votive comprising a non-flammable shell defining the barrier means and having the burnable wax portion and the wick means received therein;
said translucent body portion of the illuminated candle structure comprising a hollow structure; a light source below said votive and communicating with said cavity;
said votive being supported in the upper portion of the structure with the upper edge of the votive substantially aligned with the upper end of the structure so that the votive is substantially enclosed by the structure;

said non-flammable shell of the votive being outwardly tapered at the upper end thereof; and

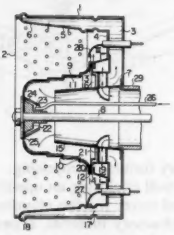
the interior of the upper end of the hollow structure comprising the translucent body portion of the candle structure being tapered to receive the shell of the votive such that the votive is supported at the top of the translucent body portion of the illuminated candle structure.

3,890,086

LIQUID FUEL BURNER FOR BURNING LIQUID FUEL IN GASIFIED FORM

Kingo Miyahara, Tokyo, Japan, assignor to Dowa Co., Ltd., Tokyo, Japan

Filed Aug. 20, 1974, Ser. No. 499,026
Claims priority, application Japan, Aug. 22, 1974, 49-98433
Int. Cl. F23d *11/04*
U.S. Cl. 431—168 **4 Claims**



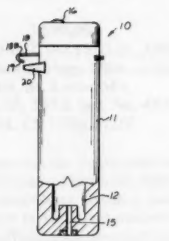
1. A liquid fuel burner for burning liquid fuel in gasified form comprising a main body made of thin sheet iron or the like, a gas chamber formed by mounting a combustion plate and an inner bottom wall along the inner periphery of the main body in spaced relationship, said combustion plate being formed therein with a multitude of gasified fuel blowing openings, a fuel gasifying member rotatably mounted within the main body, said fuel gasifying member being open at one end to communicate with said gas chamber and forming on its wall with a plurality of offset portions for promoting diffusion of the liquid fuel, a gas-air mixing plate mounted to the open end portion of said fuel gasifying member to define a scattering gap therebetween, and an air supply duct extending into the fuel gasifying member and opening therein.

3,890,087

DISPOSABLE FIREPLACE AND OVEN LIGHTER

Crowell B. Jackson, 179 E. 79th St., New York, N.Y. 10021

Filed June 17, 1974, Ser. No. 479,897
Int. Cl.² F23Q *1/02*
U.S. Cl. 431—277 **9 Claims**



1. For use in a gas lighter having a housing containing a reservoir portion for containing a volatile liquid fuel,

a normally closed valve for controlling the flow of gaseous fuel from said reservoir,

a sparking ignition means disposed in ignition relationship to said normally closed valve,

the improvement comprising:

a valve actuator connected to said normally closed valve,

means for pivotally mounting said valve actuator on said housing,

said actuator having an extended portion extending beyond the periphery of said housing,

a latching means formed on the extended end of said valve actuator,

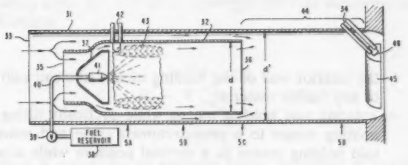
a complementary catch means formed on said housing adjacent said latching means whereby said latching means automatically engages said catch to mechanically lock said valve actuator and connected valve in the open position upon ignition of said gas lighter.

3,890,088

APPARATUS FOR REDUCING FORMATION OF OXIDES OF NITROGEN IN COMBUSTION PROCESSES

Antonio Ferri, Woodbury, N.Y., assignor to Advanced Technology Laboratories, Inc., Westbury, N.Y.

Continuation-in-part of Ser. No. 72,985, Sept. 17, 1970, abandoned. This application Nov. 22, 1972, Ser. No. 308,721
Int. Cl. F23d *13/00, 21/00*
U.S. Cl. 431—351 **10 Claims**



1. A combustion apparatus, comprising

a. means for vaporizing fuel, including means for introducing fuel into said vaporizing means for vaporization thereof;

b. mixing means downstream of said vaporizing means for mixing air with said vaporized fuel, said mixing means communicating with said vaporizing means for flow of vaporized fuel thereto, and means for flowing air into said mixing means, said mixing means being operable to mix said air and said vaporized fuel without combustion thereof;

c. combustion means downstream of said mixing means for combusting said mixture of air and vaporized fuel, including ignitor and flame-holding means for igniting said mixture of air and vaporized fuel to form a flame; and

d. said mixing means including means for passing said mixture of air and vaporized fuel from said mixing means to said combustion means at a velocity in excess of the flame propagation speed and said mixing means being of sufficient length to allow said air and vaporized fuel to be thoroughly mixed such that the mixing means delivers at said ignitor and flame-holding means a substantially uniform mixture of air and vaporized fuel on a molecular scale without prior combustion thereof.

3,890,089

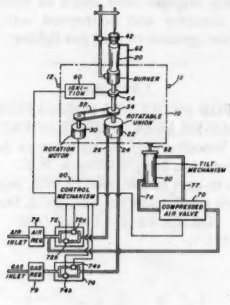
HOMOGENEOUS FUSION SYSTEM AND METHOD

Charles K. Matocha, Lower Burrell, Pa., assignor to Aluminum Company of America, Alcoa Center, Pa.

Filed Oct. 17, 1973, Ser. No. 407,094
Int. Cl. F27b *3/06*
U.S. Cl. 432—11 **10 Claims**

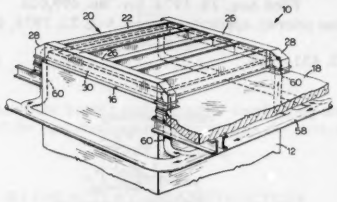
10. A process for the preparation of homogeneously fused material comprising:

a. loading fusible material into holding means;
b. heating said material within said holding means for a preselected period of time to a preselected temperature below the fusion temperature to expel entrapped air and low temperature volatiles;
c. heating said material to fusion temperature for a predetermined period of time;
d. rotating said holding means for a predetermined period of time at a predetermined angle of tilt while simultaneously heating said material at fusion temperature to lap



the interior wall of the holding means to clean said wall of any fusible material;
e. rotating said holding means while cyclically tilting said holding means to a predetermined angle and returning said holding means to a vertical position while simultaneously heating said material at fusion temperature to provide homogeneous mixing of said fusible material and elimination of gas bubbles; and
f. cooling said fused material at one or more predetermined temperatures for a predetermined period of time.

3,890,090
REFRACTORY FURNACE
Andrew G. Sanderson, 178 Patton St., King City, Ontario, Canada
Continuation-in-part of Ser. No. 346,954, April 2, 1973, Pat. No. 3,787,172. This application Nov. 14, 1973, Ser. No. 415,671
Int. Cl. F27d *1/02, 1/18*
U.S. Cl. 432—250 **5 Claims**



1. A refractory furnace comprising:
A refractory wall enclosing an upwardly opening chamber;
an overhead cover for the chamber comprising a frame carrying refractory material, a peripheral duct fixed to the frame and having at least one inlet leading into the duct, and air curtain outlet apertures opening towards the refractory wall;
conduit means located outside the refractory wall and connectable with a remote source of pressurized air, the conduit means having an outlet; and
the inlet of the cover being constructed and arranged to register with the outlet of the conduit means when the cover is positioned to close the chamber.

3,890,091

THE LEVEL DYEING OF WOOL POLYIMINE OR POLYAMINE AND SULFONATED PHENYLENE AMINO-HLOROTRIAZINE TREATED

Pierre-Rene Cathelin, Tignieu, France, and Hermann-Heinz Konrad, Kelkheim, Taunus, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

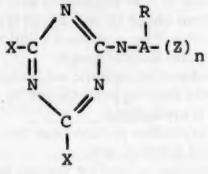
Filed Sept. 6, 1973, Ser. No. 394,797

Claims priority, application Germany, Sept. 8, 1972, 2244060

Int. Cl. D06p 7/00

U.S. Cl. 8—17 3 Claims

1. A process for the level dyeing of wool having an anti-felting finish of polyimine or polyamine resin, with fiber-reactive dyestuffs, wherein, prior to the dyeing, the wool having the anti-felting finish is pretreated with a compound of the formula



in which R is hydrogen or an alkyl radical having up to four carbon atoms, A is phenylene, Z is an anionic group selected from the group consisting of

—SO_3(H,Me)
—O—SO_3(H,Me)
—CO—O(H,Me)
—SO_2—CH_2—CH_2—O—SO_3(H,Me),

n is an integer from 1 to 3, X is chlorine or the group

and Me is an alkali metal ion; and the dyeing with the said reactive dyestuffs is then effected.

3,890,092

FLAME-RETARDANT MATERIAL AND PROCESS

Albert Y. Garner, Yellow Springs, Ohio, assignor to Monsanto Research Corporation, St. Louis, Mo.

Filed Oct. 26, 1973, Ser. No. 410,051

Int. Cl. C08g 51/56

U.S. Cl. 8—115.6 18 Claims

1. A process for improving the flame-retardancy of polybenzimidazole material, aromatic polyimide material or aromatic polyamide material comprising treating said material with aminocyclophosphazene in sufficient amount and curing the treated material at a sufficient temperature to improve flame-retardancy in high oxygen atmosphere.

3,890,093

MERCERIZING SOLUTIONS

Helmut Diery; Peter Hess; Karl-Heinz Schneider, all of Kelkheim, Taunus, and Gerhart Schneider, Schneidhain, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

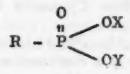
Filed June 21, 1973, Ser. No. 372,391

Claims priority, application Germany, June 26, 1972, 2231148

Int. Cl. D06m 1/02

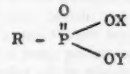
U.S. Cl. 8—127 5 Claims

1. An aqueous mercerizing solution essentially consisting of 10 to 400 g/l of sodium-, potassium- or lithium hydroxide or a mixture thereof, and 0.1 to 5 g/l of phosphonic acid derivative of the formula



in which R stands for an aliphatic linear, branched or cyclic hydrocarbon radical having 6 to 10 carbon atoms, and X and Y which may be identical or different, each stands for hydrogen, sodium, potassium or an aliphatic linear or branched hydrocarbon radical having 1 to 4 carbon atoms.

5. A process for treating with lyes and mercerizing cellulosic fibrous material, which comprises treating the fibrous material with an aqueous alkaline mercerizing solution containing, as a wetting agent 0.1 to 5 g/l of a phosphonic acid derivative of the formula



in which R stands for an aliphatic linear, branched or cyclic hydrocarbon radical having 6 to 10 carbon atoms, and X and Y which may be identical or different each stands for hydrogen, sodium, potassium or an aliphatic linear or branched hydrocarbon radical having 1 to 4 carbon atoms.

3,890,094

POLYESTER TEXTILE DYED WITH YELLOW ESTER DYESTUFFS

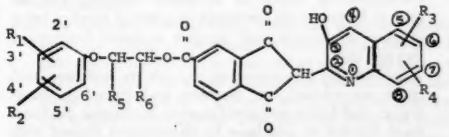
Guido R. Genta, Snyder, N.Y., assignor to American Aniline Products, Inc., Paterson, N.J.

Filed Oct. 25, 1972, Ser. No. 300,706

Int. Cl. D06p 3/54

U.S. Cl. 8—179 5 Claims

1. A polyester textile dyed with a compound of the formula:



wherein
each of R_1 and R_2 is independently hydrogen, chlorine, bromine, lower alkyl or phenyl, or R_1 and R_2 taken together form a 2',3'- or 3',4'-benzo group;
R_3 is hydrogen, chlorine, bromine, lower alkyl, lower alkoxy or cyano;
R_4 is hydrogen, chlorine, bromine or methyl; or R_3 and R_4 taken together are a benzo group; and
one of R_5 and R_6 is hydrogen and the other is hydrogen or methyl.

3,890,095
CELLULOSIC TEXTILE FINISH WITH 1,3-DIMETHYLOL-4,5-DIHYDROXY-2-IMIDAZOLIDINONE, ZINC NITRATE AND A SEQUESTERING AGENT

Robert Francis Bann, Somerville; William Joseph Moran, Martinsville, and Philip B. Roth, Somerville, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

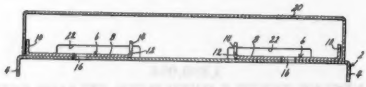
Continuation-in-part of Ser. No. 114,380, Feb. 10, 1971, Pat. No. 3,746,505, which is a continuation of Ser. No. 672,450, Oct. 3, 1967, abandoned, which is a continuation-in-part of Ser. No. 628,573, April 5, 1967, abandoned. This application Apr. 23, 1973, Ser. No. 352,778
Int. Cl. D06p *5/02;* **D06m** *13/12, 13/34*
U.S. Cl. 8—185 **11 Claims**

1. A textile finishing composition useful for rendering cellulosic textile materials wrinkle resistant and providing permanent creases therein comprising an aqueous solution of 1,3-dimethylol-4,5-dihydroxy-2-imidazolidinone, a zinc nitrate catalyst abd a sequestering agent; wherein the amount of the 1,3-dimethylol-4,5-dihydroxy-2-imidazolidinone is sufficient to provide the textile to be treated with between 1.0 and 25.0 percent of said imidazolidinone based on the weight of said textile; the amount of zinc nitrate catalyst is between 5.5 and 16.5 percent based upon the weight of the imidazolidinone and the amount of sequestering agent is between 0.05 and 3.0 percent based on the weight of the solution.

3,890,096
TRAY FOR STERILIZING DENTAL INSTRUMENTS

George D. Nichol, 411 Washington St., Pittsfield, Ill. 62363, and John C. Schmidt, 2307 Castilla Isle, Fort Lauderdale, Fla. 33301

Filed Oct. 1, 1973, Ser. No. 402,044
Int. Cl. A61l *3/02*
U.S. Cl. 21—105 **1 Claim**



1. A dental instrument tray comprising:
a. a generally planar base provided with downturned flaps operable to support the remainder thereof above a supporting surface engaged by said flaps, and having holes formed therethrough for the circulation of steam when said tray is inserted into an autoclave,
b. a pair of upwardly opening channels affixed to the top of said base in parallel spaced apart relation, the upright distal flanges of said channels being solid and imperforate, and the proximate flanges of said channels having corresponding series of upwardly opening notches formed therein, each corresponding pair of notches being adapted to receive and support a dental instrument therein, and
c. a downwardly opening cover restable on said base, said cover surrounding said channels and extending thereabove, and being restrained against horizontal displacement relative to said base by engagement thereof with upwardly projecting portions of said channels, said base and cover both being generally rectangular in a horizontal plane, said base flaps being provided along a pair of opposite edges thereof and being horizontally spaced relative to one another, the horizontal space between said flaps being slightly greater than the corresponding horizontal dimension of said cover, whereby like trays, each with its cover applied, may be nestably stacked.

3,890,097
METHOD OF PURIFYING WET PROCESS PHOSPHORIC ACID

John T. Minor, Ponca City, Okla., assignor to Agrico Chemical Company, Tulsa, Okla.

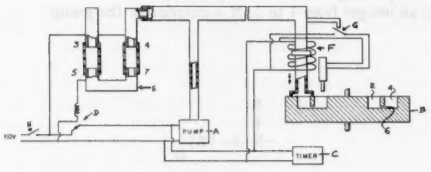
Filed May 6, 1974, Ser. No. 467,265
Int. Cl. B01d *9/00*
U.S. Cl. 23—300 **8 Claims**

1. A method of purifying merchant strength wet process phosphoric acid having, by weight, about 71 percent to 76 percent phosphoric acid and 3 percent to 6 percent sulfuric acid which comprises the steps of:
combining a quantity of sulfuric acid with said wet process phosphoric acid to raise the sulfuric acid concentration to a value between about 10 and 20 percent, by weight, so that the viscosity of the combined solution is lowered and the freezing point thereof raised;
cooling the combined phosphoric acid solution to a temperature below the freezing point thereof so that a portion of the solution is crystallized;
separating the crystalline portion from the remaining liquid portion of said solution; and
melting the separated crystalline portion to obtain purified phosphoric acid solution.

3,890,098
MACHINE FOR THE DETERMINATION OF PROTROMBIN TIME AND P.T.T.

Enrique Moreno, G.P.O. Box 3088, San Juan, P.R. 00936

Filed Nov. 16, 1973, Ser. No. 416,429
Int. Cl. G01n *11/04, 33/16*
U.S. Cl. 23—230 B **1 Claim**



1. A machine for determining Protrombin time, comprising a rotatable member, at least one pair of adjacent cup-like receptacles formed in the rotatable member, restricted orifice means providing communication between the bottom parts of the two cup-like members, means for sealing the upper end of one of the cup-like members after a reactive material and plasma have been placed therein, means for inducing movement of the plasma and reactive material from cup to cup until coagulation takes place, means for stopping the induced cup-to-cup movement, and means for measuring the time required for coagulation.

3,890,099
COLORIMETRIC ASSAY FOR UREA

David H. Jung, 3240 Brill Rd., Indianapolis, Ind. 46227

Filed July 5, 1974, Ser. No. 486,062
Int. Cl. G01n *33/16*
U.S. Cl. 23—230 B **17 Claims**

1. A process for determining the urea content of fluids comprising:
a. mixing:
1. ortho-phthalaldehyde;

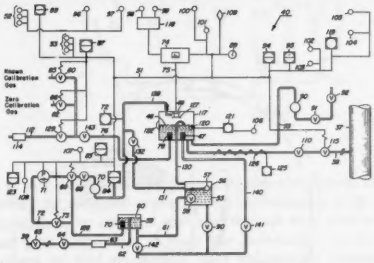
2. a fluid sample;
3. N-(1-naphthyl) ethylenediamine dihydrochloride; and
b. obtaining a colorimetric reading after a period of time for the resulting mixture.

3,890,100

GAS CONDITIONING AND ANALYZING SYSTEM

Francis R. Busch, Morganhill, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Sept. 28, 1973, Ser. No. 401,953
Int. Cl. G01n *31/12*; G21c *17/00*
U.S. Cl. 23—232 E **43 Claims**



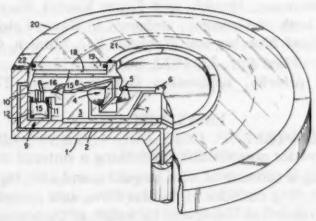
34. The method for conditioning and analyzing a gas sample comprising the steps of
a. introducing the gas sample to a detection zone for release under a liquid of desired conditions,
b. analyzing the sample gas introduced to the detection zone for the concentration of a selected constituent,
c. withdrawing the gas from the detection zone to a flame checking zone,
d. withdrawing the liquid from the detection zone to a regulator zone that regulates the liquid level in the detection zone,
e. discharging the gas from the flame checking zone to a discharge point and,
f. discharging the liquid from the regulator zone to a drain.

3,890,101

COLLECTION RING FOR USE IN MULTIPLE-SAMPLE BLOOD FRACTIONATION CENTRIFUGAL ROTORS

Thomas O. Tiffany, Oak Ridge; William A. Walker, Knoxville, and Wayne F. Johnson, Loudon, all of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 15, 1974, Ser. No. 443,078
Int. Cl. B01l *3/00*
U.S. Cl. 23—259 **5 Claims**



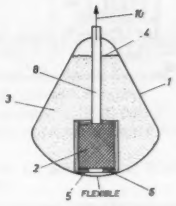
1. An improved sample collection ring for use in multiple-sample blood fractionation centrifugal rotors characterized by a central rotor portion for preparing blood fractions having a multiplicity of circumferential discharge ports; said collection ring comprising:
i. a removable annular vial holder ring having a top surface and a bottom surface nested concentrically about said central rotor portion, said vial holder ring defining:
a. first and second nipples positioned alternatively in a circular array, said nipples depending from the bottom side of said vial holder ring;
b. a first array of passageways having centripetal ends opening in register with said circumferential discharge ports and centrifugal ends opening in the bottom ends of said first nipples;
c. a second array of passageways communicating between and opening in the bottom ends of pairs of said first and second nipples; and
d. a third array of passageways having centrifugal ends opening in the bottom ends of said second nipples and centripetal ends opening in said top surface of said vial holder ring;
ii. primary and secondary sample collection vials removably attached to said first and second nipples, respectively; and
iii. means for sealing said sample collection vials to said nipples.

3,890,102

CATALYTIC ACTION GAS GENERATOR

Dietrich Gathmann, Bremen, and Walter Mayland, Moordeich, Bremen, both of Germany, assignors to ERNO Raumfahrttechnik GmbH, Bremen, Germany

Filed Dec. 13, 1972, Ser. No. 314,765
Claims priority, application Germany, Dec. 31, 1971, 2165883
Int. Cl. B01j *7/02*
U.S. Cl. 23—282 **3 Claims**



1. Apparatus for generating gas by catalytic decomposition of a liquid, comprising:
a pressure vessel with a completely closed interior containing the liquid, the liquid having a particular surface level in the vessel;
a container disposed inside of the vessel and having an inlet disposed near the bottom of the vessel, below said level, the container further having an outlet and containing a catalytic substance defining a tortuous path between the inlet and the outlet, and having substantial resistance to flow of gas therethrough, whereby significant pressure is needed to drive the liquid into and through the catalyst, the inlet being normally covered by a breakable partition separating the interior of the container from its outside, which is the interior of the vessel, the partition being destructible;
means included in the pressure vessel and being accessible from the outside of the vessel for effecting destruction of said partition from the outside of the vessel and without having to open the vessel so that upon destruction of the partition the catalyst is exposed to the liquid as entering the container through the inlet and contacting the catalyst so that gas develops adjacent the inlet, and accumulates above said surface level in the vessel and pressurizes the interior of the vessel; and

an outlet duct for the container connected to the outlet thereof and leading also out of the vessel, so that gas developed on contact of the liquid with the catalyst and having passed through said tortuous path may discharge, the accumulated gas inside of the vessel acting as propellant for driving liquid into the catalyst to sustain development of gas and discharge of such gas through the outlet duct.

3,890,103
ANTI-POLLUTION EXHAUST APPARATUS

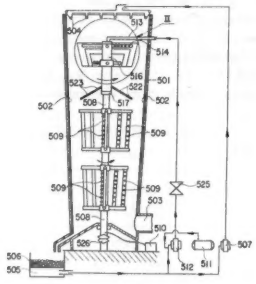
Jinemon Konishi, 21-14, 1-chome Nakasakurazuka, Toyonaka City, Osaka, Japan

Filed Aug. 23, 1972, Ser. No. 282,990

Claims priority, application Japan, Aug. 25, 1971, 46-64950; Aug. 25, 1971, 46-64951; Sept. 6, 1971, 46-68794; Oct. 12, 1971, 46-80298; Oct. 25, 1971, 46-84551

Int. Cl. C01b *17/74*; **B03c** *3/16*

U.S. Cl. 23—284 **7 Claims**



1. A pollution-reducing exhaust apparatus comprising:

a. a vertically oriented conduit having a frusto-conical inner surface with an inside diameter larger at an upper end than at a lower end,

b. an inlet near the lower end of the conduit for allowing hot, contaminant bearing gas to flow from a source of the gas into the conduit,

c. a first electrical pole axially mounted within the conduit for ionizing the contaminants,

d. a second electrical pole mounted on the inner surface of the conduit for collecting the ionized contaminants,

e. a source of liquid,

f. a source of compressed air,

g. a first spraying means positioned on the top of the first electrical pole, but elecrically insulated therefrom, and connected to the source of liquid and to the source of compressed air for spraying an air-liquid foam into the hot gas, the first spraying means comprising a first rotatably mounted rotator and a plurality of arms extending radially from the rotator, each arm containing a series of holes on one lateral side for producing rotation of the arms and rotator as the air-liquid foam is sprayed from the holes, and

h. a second spraying means located near the upper end of the conduit, connected to the source of liquid and directed toward the inner surface of the conduit for washing the second electrical pole and the inner surface of the conduit.

3,890,104
CATALYTIC CARTRIDGE

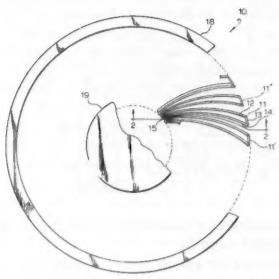
Paolo Della Porta; Bruno Ferrario; Angelo Cantaluppi; Paolo Montalenti, and Fiziano A. Giorgi, all of Milan, Italy, assignors to Saes Getters S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 194,445, Nov. 1, 1971, Pat. No. 3,857,680. This application May 3, 1972, Ser. No. 249,771

Claims priority, application Italy, Nov. 3, 1970, 31307/70The portion of the term of this patent subsequent to Dec. 31, 1991, has been disclaimed.

Int. Cl.[2] B01J *8/04*; **B21D** *53/02*; **B23P** *15/26*

U.S. Cl. 23—288 K **10 Claims**



1. A catalytic cartridge formed of a metal strip folded alternately in opposite directions such that the strip comprises a plurality of members each comprising:

A. a first spirated segment;

B. an outer circumferential segment attached to the first spirated segment;

C. a second spirated segment attached to the outer circumferential segment;

D. an inner circumferential segment attached to the second spirated segment;

wherein the inner circumferential segment of any given member is attached to the first spirated segment of the next member,

wherein a catalytic material is carried by the strip.

3,890,105
METALLIC SINTERING POWDER OR ALLOY

Gerd Weissmann, Munich, and Edgar Kuebel, Fuerstenfeldbruck, both of Germany, assignors to Bayer Leichtmetallwerk- Graf Bluecher von Wahlstatt KG, Munich, Germany

Filed Apr. 23, 1973, Ser. No. 353,454

Claims priority, application Germany, Apr. 27, 1972, 2220683

Int. Cl. B22f *1/00*

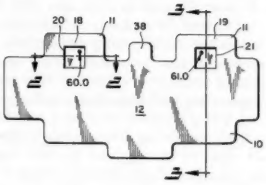
U.S. Cl. 29—182.7 **18 Claims**

1. A powder composition for making a sintered steel alloy comprising a mixture of iron powders, and alloying components including carbides in powder form, said carbides being present from 0.5 to 50 percent by weight of the total composition, said carbides comprising an additive and wholly or predominantly carbon deficient carbides selected from the group consisting of chromium carbides, manganese carbides and mixed carbides of chromium and manganese and including the structural types M_3C, M_7C_3, $M_{23}C_6$, wherein M is the metal component and C is the carbon component of the carbide.

3,890,106
SELECTIVE COLD WORK HARDENING OF METALLIC EXTRUSIONS

Paul J. Miller, Richmond Heights, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio

Filed Feb. 27, 1973, Ser. No. 336,274
Int. Cl. B22f *5/00*
U.S. Cl. 29—183 **5 Claims**



1. An integral body of work hardenable brass, said body having an extruded cross section including at least one port projection, an internal seat and threads in a central area of said port projection, at least one indentation on an exterior surface of said projection, said indentation resulting from plastic displacement of material at said central area whereby the material below said indentation forming said central port area and including said seat and said threads is in a locally work hardened state throughout the thickness of the body from one face to the other produced by local cold working substantially limited to the area of the one port projection whereby a major portion of the body is not hardened beyond its extruded condition.

3,890,107
MATERIALS USEFUL FOR PROSTHETIC DEVICES AND THE LIKE

Eugene W. White; Jon N. Weber, both of State College, Pa., and Rodney A. White, Syracuse, N.Y., assignors to Research Corporation, New York, N.Y.

Filed Sept. 25, 1972, Ser. No. 291,547
Int. Cl. B27f *5/00*
U.S. Cl. 29—183 **19 Claims**

1. A substantially uniform permeable microporous synthetic material useful as a biomaterial, such as for the manufacture of prosthetic devices, characterized by a substantially uniform pore volume in the range from about 10 to about 90% and having a microstructure characterized by a pronounced three-dimensional fenestrate structure corresponding to the microstructure of the porous carbonate echinoderm or scleractinian coral skeletal material of marine life and providing a periodic minimal surface, said periodic minimal surface dividing the volume of said material into two interpenetrating regions, each of which is a single, multiply connected domain, said material having a substantially uniform pore size diameter and substantially uniform pore connections or openings in the range from about 5 microns to about 500 microns.

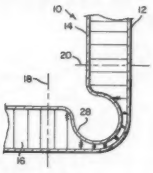
3,890,108
STRUCTURAL PANEL BENT FROM LAMINATED HONEYCOMB

James W. Welsh, San Diego, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 224,835, Feb. 9, 1973, Pat. No. 3,757,559. This application Apr. 16, 1973, Ser. No. 351,699
Int. Cl.² B23P *3/20*
U.S. Cl. 29—191.4 **1 Claim**

1. A structural panel formed of a metallic inner skin, a metallic outer skin and a honeycomb core positioned between said inner and outer skins and secured to both of said skins with its cells normal to said skins, the improvement comprising:

said panel having a bend therein, said panel being substantially planar and defining a first plane on the first side of said bend and being substantially planar and defining a second plane on the second side of said bend, a first reference line normal to said first plane and a second reference line normal to said second plane, said skins being continuous from said first to said second reference lines, said core being crushed at said bend between said



first and second reference lines, said inner skin and said outer skin each being bent concave toward the inside of said bend, said inner skin being bent to a smaller radius of curvature in said bend than said outer skin, said inner skin and said outer skin each being unstretched along its length between said reference lines so that the distance between said first and second reference lines along said inner skin is equal to the distance between said first and second reference lines along said outer skin, said inner skin being closer to said outer skin in said bend than at said first reference line.

3,890,109
RAZOR BLADES HAVING HIGH PURITY Al_2O_3 COATING

Frederick O. Jones, Bracknell, England, assignor to Wilkinson Sword Limited, London, England

Filed Apr. 6, 1973, Ser. No. 349,269
Claims priority, application United Kingdom, Apr. 8, 1972, 16297/72
Int. Cl. B32b *15/04;* **B26b** *21/54*
U.S. Cl. 29—195 **12 Claims**

1. A razor blade having an alumina coating on and/or adjacent a cutting edge thereof, the alumina containing less than 3×10^{-3} atomic percent of impurities.

3,890,110
COMPOSITE COATED STEEL STRUCTURE FOR CORROSION RESISTANCE

Frederick A. Glaski, Torrance, Calif., assignor to Fansteel Inc., N. Chicago, Ill.

Division of Ser. No. 284,639, Aug. 29, 1972, Pat. No. 3,784,403, which is a continuation-in-part of Ser. No. 177,929, Sept. 7, 1971, Pat. No. 3,767,456. This application June 4, 1973, Ser. No. 366,284
Int. Cl.² B23P *3/00*
U.S. Cl. 29—198 **1 Claim**

1. A composite structure having a corrosion resistant surface which comprises:

a. a non-refractory steel substrate containing free carbon and metal carbides,

b. a displacement diffusion containment coating on said substrate to isolate carbon and metal carbides from the surface of the substrate composed of titanium carbide formed from an in situ combination of titanium with the carbon and metal carbides of the substrate, said displacement diffusion coating being stable in the presence of tantalum or columbium at temperatures ranging from 900° to 1,100°C., and

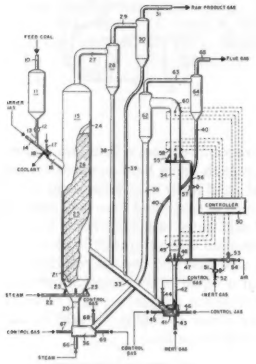
c. a corrosion resistant material selected from the group consisting of tantalum and columbium molecularly bonded to said containment coating by chemical vapor deposition.

3,890,111

TRANSFER LINE BURNER SYSTEM USING LOW OXYGEN CONTENT GAS

Christian W. Knudsen, Seabrook, Tex., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Feb. 21, 1974, Ser. No. 444,613
Int. Cl. C10j *3/12*
U.S. Cl. 48—197 R **10 Claims**



1. In a process wherein a stream of hot carbonaceous particles is continuously withdrawn from a fluidized bed reaction vessel, circulated upwardly through a transfer line burner for the combustion of a portion of the carbon in said particles, and returned to said fluidized bed reaction vessel, the improvement which comprises introducing said stream of hot particles into the lower end of said transfer line burner as a dense phase stream containing an inert gas essentially free of molecular oxygen and injecting a molecular oxygen-containing gaseous mixture having a molecular oxygen content less than about 15 percent by volume into said burner near the lower end thereof in a quantity sufficient to effect a transition from dense phase to dilute phase flow and promote said combustion of said carbon.

3,890,112

TWO-STAGE PROCESS FOR THE CONVERSION OF LIQUID HYDROCARBON TO A METHANE RICH GAS STREAM

Clyde L. Aldridge, Parish of E. Baton Rouge, La., assignor to Exxon Research and Engineering Company, Linden, N.J.

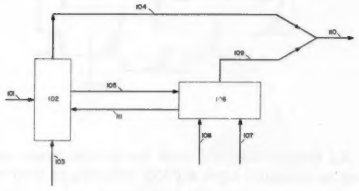
Continuation-in-part of Ser. No. 125,581, March 18, 1971, abandoned. This application Aug. 15, 1972, Ser. No. 280,761.
The portion of the term of this patent subsequent to June 11, 1991, has been disclaimed.
Int. Cl. C01b *2/14*
U.S. Cl. 48—214 **19 Claims**

1. A process for producing a methane-rich stream by treating a hydrocarbon feedstream containing a liquid hydrocarbon, which comprises:

a. treating said feedstream in a first reaction zone maintained at a pressure between about 250 and 1,500 psig, and at a temperature between about 1,200° and 1,450°F in the presence of particulate catalyst composition comprising an alkali metal compound and a solid particulate material to produce a vaporous product comprising CH_4 and other light hydrocarbon products, and a solid hydrocarbon material which deposits on said particulate composition;

b. removing said vaporous product from said first reaction zone;

c. passing at least a portion of said particulate catalyst composition with the solid hydrocarbon material deposition to a second reaction zone maintained at a pressure between about 250 and 1,500 psig and at a temperature between about 1,000°F and 1,600°F to contact steam introduced into said second reaction zone at a steam-to-carbon in solid hydrocarbon material of the second reaction zone mole ratio between 1 and 10, whereby at least a portion of the solid hydrocarbon material deposition is converted into a gaseous product comprising CH_4, H_2, CO and CO_2; and



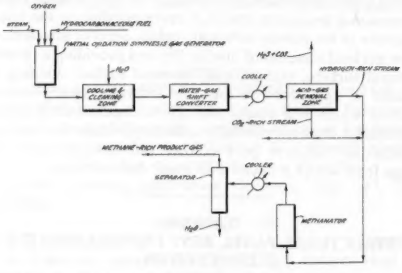
d. removing said gaseous product from said second reaction zone.

3,890,113

PRODUCTION OF METHANE

Edward T Child, Hacienda Heights, and Allen M. Robin, Anaheim, both of Calif., assignors to Texaco Inc., New York, N.Y.

Filed June 25, 1973, Ser. No. 373,533
Int. Cl. C10b *49/02, 57/02*
U.S. Cl. 48—197 R **10 Claims**



1. A process for producing a methane-rich gas stream comprising

1. producing a raw process gas stream principally comprising CO, H_2, CO_2, and H_2O and optionally containing particulate carbon, CH_4, H_2S and COS by the partial oxidation of a hydrocarbonaceous feedstock with a free-oxygen containing gas comprising about 90 to 99.9 mole % O_2 and optionally with a temperature moderator, in the

reaction zone of a gas generator at an autogenous temperature in the range of about 1200° to 3500°F. and a pressure in the range of about 1 to 350 atm. abs.:

2. cooling, cleaning and adding supplemental H_2O to the effluent gas stream from (1) to produce a feed gas stream for water-gas shift conversion having a mole ratio H_2O/CO in the range of about 2 to 8;
3. reacting the feed gas stream from (2) in a catalytic water-gas shift conversion zone at a temperature in the range of about 650° to 950°F. and a pressure in the range of about 1 to 350 atm. abs. until at least 75 mole % of the CO is reacted with H_2O to produce H_2 and CO_2;
4. cooling, and purifying the effluent gas stream from (3) in an acid-gas purification zone and separating a CO_2-rich gas stream and optionally a separate stream of H_2S and COS, producing a hydrogen-rich gas stream;
5. mixing at least a portion of the CO_2-rich gas stream from (4) with the hydrogen-rich gas stream from (4) providing a feed gas mixture having a mole ratio H_2/CO_2 in the range of 4 to 10, reacting together at a temperature in the range of about 400° to 1500°F. in a catalytic methanation zone hydrogen and substantially all of the carbon oxides in said feed gas mixture, and removing from said methanation zone an effluent gas stream substantially comprising in mole % dry basis CH_4 50 to 96, H_2 3 to 46, CO 0 to 0.5, CO_2 0.3 to 0.7, $A+N_2$ 0.2 to 8; and
6. cooling the effluent gas stream from (5) and separating H_2O therefrom to produce said methane-rich product stream.

3,890,114

DOUBLE-DISC FLAT-LAPPING OR HONING MACHINE INCLUDING A FREE-WHEELING DRIVE CONNECTION

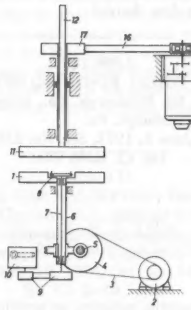
Hans-Friedrich Bovensiepen, Metzkausen, Germany, assignor to Peter Wolters, Mettmann, Rhineland, Germany

Filed June 11, 1973, Ser. No. 368,577

Claims priority, application Germany, June 15, 1972, 2229196

Int. Cl. B24b 7/04

U.S. Cl. 51—118 **3 Claims**



2. In a dual-disced flat-lapping and honing machine in combination:

a pair of confronting rotatable working discs and a rotatable workpiece holder disposed between two working discs, a reversible motor operatively connected to the first disc for optionally controlling the direction of rotation of the first disc, a motor operatively connected to the workpiece holder, drive means operatively connected through a free-wheeling coupling to the second working disc and functioning as a braking motor in such a way that when the braking motor is turned off, frictional engagement between workpieces of the said workpiece holder rotating in a first direction and the second working disc causes the rotation of the second working disc and reverse rotation of the workpieces of the workpiece holder causes the second working disc to become locked against rotation.

3,890,115

BACKING WHEEL FOR A BELT GRINDER

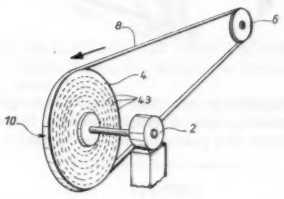
Herbert Stahl, Bottingen, Germany, assignor to SM Maschinenfabrik Herbert Stahl, Bottingen, Germany

Filed Aug. 23, 1974, Ser. No. 500,024

Claims priority, application Germany, Aug. 24, 1973, 2342831

Int. Cl. B24b 21/00

U.S. Cl. 51—135 R **10 Claims**



1. A rotatable, laminar backing wheel for an abrasive belt comprising:

a. a first substantially circular disk of a soft and resilient material having a fist elastic modulus in tension;
b. second and third substantially circular disks of materials having respective second and third elastic moduli in tension;
c. fastening means coaxially fastening said first disk between said second and third disks under axial compression,
   1. said second and third disks having respective circumferential face portions defining a common surface of rotation, and said first disk having a circumferential face portion substantially completely confined within said surface when said wheel does not rotate,
   2. said first modulus being sufficiently smaller than said second and third moduli to cause the circumferential face portion of said first disk to project radially beyond said common surface under centrifugal forces when said wheel rotates.
   3. said compression being sufficient to cause the radially projecting face portion of said first disk to spread axially into radial alignment with said second and third disks.

3,890,116

GRINDING MACHINE

Edward G. Robillard, Cherry Valley, Mass., assignor to Cincinnati Milacron-Heald Corporation, Worcester, Mass.

Filed Dec. 3, 1973, Ser. No. 421,028

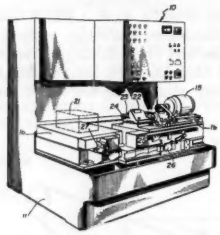
Int. Cl. B24b 51/00

U.S. Cl. 51—165.71 **11 Claims**

1. A grinding machine, comprising

a. a base,
b. a workhead slide mounted on the base,
c. a wheelhead slide mounted on the base,
d. a feed mechanism, including a stepping motor, for producing transverse relative movement between the slides to produce a grinding cycle,
e. a first pulse generator having a first section for producing pulses at a first rate and a second section for producing pulses at a second rate which is substantially greater than the first rate, and
f. a control means for introducing pulses from the first section to the stepping motor during a portion of the grinding cycle and for introducing pulses from the second section to the stepping motor during another portion of the grinding cycle, the control means including a shifter

means operative during an interval when the rate of pulses introduced to the stepping motor is changed between a first value and a second value, to introduce to the



stepping motor pulses at rates of smoothly changing value thereby avoiding loss of synchronization between the stepping motor and pulses during the change.

3,890,117

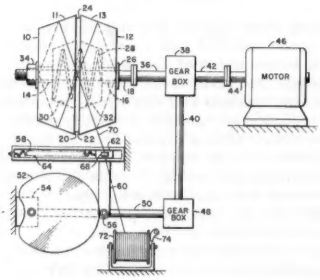
REINFORCING CUP-TYPE GRINDING WHEELS

George N. Peterson, Grafton, Mass., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed June 2, 1971, Ser. No. 149,192

Int. Cl. B24d *5/00, 7/00*

U.S. Cl. 51—209 R **3 Claims**



1. In combination:

a cup-type grinding wheel having an annular peripheral surface tapering from a grinding face;

a plurality of discontinuous strands of filamentary material wound in tension around portions of the peripheral surface of said wheel in a direction nonparallel to the grinding face thereof, each strand being wound between 90° and less than 360° of said peripheral surface; and

means for bonding said strands to the peripheral surface of said wheel so as to maintain the wheel in compression.

3,890,118

METHOD OF GRINDING GEARS

Koichi Takahashi, Yokohama, and Nobuteru Hitomi, Yokosuka, both of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

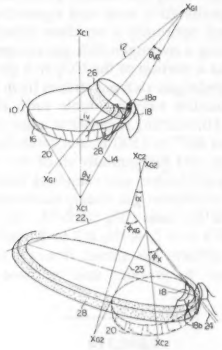
Filed Oct. 18, 1973, Ser. No. 407,606

Claims priority, application Japan, Oct. 19, 1972, 47-104016

Int. Cl. B24b *1/00*

U.S. Cl. 51—287 **8 Claims**

1. A method of grinding the tooth surfaces of gears with circular teeth, comprising the steps of applying an internal grinding conic surface of a truncated cone shaped grinding wheel of cup-like hollow construction to a circular arc shaped, convexly curved tooth trace of the gear, said grinding wheel having a cone in which said grinding conic surface forms a part thereof, said tooth trace having a cone in which said tooth trace forms a part of a circle forming an intersection of said cone and a plane perpendicular to a central axis of said cone, said grinding wheel being disposed on a central axis of said cone thereof in inclined and intersecting relationship to said central axis of said cone of said tooth trace, said grinding wheel being disposed in such a manner that a generatrix of said cone thereof always coincides with a generatrix of said



cone of said tooth trace, said grinding conic surface having a radius of curvature which makes a maximum difference between said radius of curvature and a radius of curvature of said tooth trace within a range in which there occurs no geometrical interference of an external surface of said grinding wheel with a concavely curved tooth trace located opposedly adjacent to said convexly curved tooth trace to be ground, rotating said grinding wheel around said central axis of said cone thereof for grinding of said tooth trace, revolving said grinding wheel around said central axis of said cone of said tooth trace for grinding thereof.

3,890,119

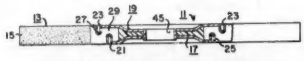
FLAP WHEEL FINISHING DEVICE

Gus J. Schaffner, III, Pittsburgh, Pa., assignor to Schaffner Mfg. Co., Inc., Pittsburgh, Pa.

Filed June 5, 1972, Ser. No. 259,538

Int. Cl. B24b *9/02*

U.S. Cl. 51—334 **6 Claims**

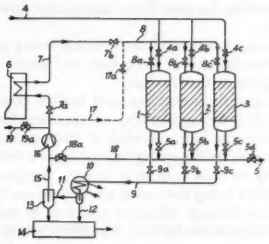


1. Finishing apparatus including an annulus of flaps of relatively small width, the flaps of said annulus being bonded near the center of said annulus to form a central core, said flaps extending freely from said core, the said core having slots penetrating into the opposite surfaces thereof and extending generally coaxial with said annulus, the said annulus to accommodate flange discs on opposite surfaces of said annulus extending over said core generally coaxially with said annulus with the flanges of said discs engaging said slots, the sum of the widths of said flanges being such that if the flanges were coextensive they could not be accommodated by the width of said flaps, the said apparatus being characterized by that a said slot extending into one surface is displaced radially with respect to the corresponding slots extending into the opposite surface so that no pair of slots extending into opposite surfaces of said core are coextensive.

3,890,120
PROCESS TO RECOVER SULPHUR FROM THE SULPHUR COMPOUNDS CONTAINED IN RESIDUAL GASES

Gilbert Guyot, Pau; Pierre Mathieu; Andre Philippe, both of Orthez; Pierre Grancher, Pau, and Jean Solinhac, Orthez, all of France, assignors to Societe Nationale des Petroles

Filed Apr. 13, 1973, Ser. No. 350,913
Claims priority, application France, Apr. 18, 1972, 72.13568; Apr. 6, 1973, 73.12460
Int. Cl. B01d *53/04*
U.S. Cl. 55—62 15 Claims

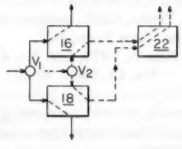


1. In a process for desulphurizing residual gases containing small concentrations of hydrogen sulphide, sulphur dioxide and possibly vesicular sulphur, wherein said residual gases are passed over an adsorbent comprising alumina, mixtures of alumina and silica or combinations of silica and alumina, at a temperature of between atmospheric temperature and about 180°C, and the sulphur-loaded adsorbent is then brought into contact with a hot regenerating gas to desorb the sulphur and thus regenerate the adsorbent, the improvements comprising: controlling the contact time between the residual gases and adsorbent to between about 1 and 25 seconds, using an oxygen-free gas at a temperature of between about 200° and 350°C as the hot regenerating gas to desorb the sulphur and thus regenerate the adsorbent and blowing the adsorbent with an oxygen-free gas at a temperature of less than 180°C after the regeneration step to cool the adsorbent to a temperature required for contact with the untreated residual gases in a repeated operation, the blowing gas which is used to cool the adsorbent containing water vapor during at least part of the blowing operation to rehydrate the adsorbent so that it will not adsorb any more steam when brought into contact with the untreated gas.

3,890,121
NOBLE GAS ABSORPTION PROCESS

Jess W. Thomas, Chatham, N.J., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 19, 1974, Ser. No. 443,262
Int. Cl. B01d *53/02*
U.S. Cl. 55—62 6 Claims



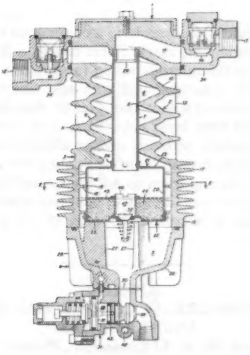
1. The method of removing a noble gas selected from the group consisting of krypton, xenon and radon from air containing concentrations thereof up to about 10^{15} pCi/liter comprising the steps of:

a. passing a finite volume of an influent of said air at some flow rate through a first activated charcoal filter to adsorb the noble gas present in said air;
b. then heating said first charcoal filter to drive off said noble gas and passing through said first charcoal filter a substantially reduced finite volume of air containing concentrations of said noble gas up to about 10^{15} pCi/liter at a reduced flow rate to form an effluent containing said noble gas released by said first charcoal filter;
c. cooling said effluent;
d. passing said effluent through a second activated charcoal filter for adsorbing the noble gas present.

3,890,122
PLURAL-STAGE AIR FILTER ASSEMBLY

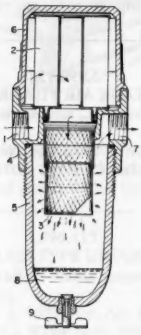
Virgil L. Frantz, Salem, Va., assignor to Graham-White Sales Corp., Salem, Va.

Filed Nov. 1, 1973, Ser. No. 412,014
Int. Cl. B01d *45/16*
U.S. Cl. 55—212 11 Claims



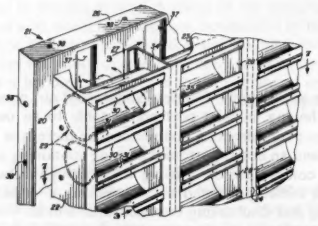
10. An assembly for filtering compressed air, comprising a housing having an inlet port connectable to an outlet of a compressor for admitting compressed air therefrom into said housing and an outlet port, said housing containing means for filtering compressed air passing therethrough between said inlet and outlet ports and a sump having a drain port for collecting and discharging contaminants, a drain valve opening independently of air pressure within said housing in response to and substantially throughout unloading of said compressor for draining contaminants from said sump through said drain port, and valve means in said inlet port for controlling flow of compressed air therethrough into said housing, said valve means being open during a pumping cycle of said compressor and closing at a predetermined low pressure during an unloading cycle thereof for then maintaining said low pressure in said compressor by preventing complete unloading thereof through said drain port.

3,890,123
MIST SEPARATOR
Atsushi Kuga, Kasukabe, Japan, assignor to Shoketsu Kinzoku Kogyo Kabushiki Kaisha, Japan
Continuation of Ser. No. 189,344, Oct. 14, 1971, abandoned. This application Dec. 6, 1973, Ser. No. 422,340
Claims priority, application Japan, May 19, 1969, 44-45265; Sept. 25, 1969, 44-75831
Int. Cl. B01d *39/08*
U.S. Cl. 55—318 **5 Claims**



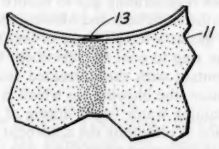
1. A mist separator comprising a continuous fine fiber layer formed by overlapping single fibers having a diameter in the range of 0.1 to 0.5 microns which range is the equivalent of the mists to be separated and with said fibers forming slits therebetween having a width not greater than the diameter of said fibers, said fiber layer being formed of a plastic material having a hydrophilic property and an affinity for oil based on capillary condensation so that fine liquid particles are formed into drops by forcing them to adhere to said fine fiber layer continuously, and said fiber layer bent into a pleated chrysanthemum shape to increase the area of air passage therethrough.

3,890,124
COMBINATION GREASE CENTRIFUGAL SEPARATOR AND FLAME TRAP
Leslie D. Howes, 742 W. El Camino Dr., Phoenix, Ariz. 85021
Filed July 22, 1974, Ser. No. 490,381
Int. Cl. B01d *45/12*
U.S. Cl. 55—346 **4 Claims**



1. A grease extracting baffle and flame trap for mounting in the exhaust duct of a ventilating system of a cooking unit comprising:
a plurality of baffles each formed to provide a substantially cylindrically shaped open ended pocket for receiving the grease laden gases for causing them to acquire a rotary and whirling movement about an annular axis in the pocket,
means mounting said baffles so that a first opening to each of said pockets arranged along their lengths is arranged with similar openings of the other pockets in a coplanar arrangement said mounting means including walls spaced from and transverse said open ended ends,
said means being angularly positionable in the ventilating system of a cooking unit so that the first openings to said pockets receive the grease laden gases being vented to atmosphere, and
a second opening for each of said pockets in the lower portion of said mounting means,
said second opening being arranged laterally of the rotary and whirling movement of the gases in that pocket for exhausting the gases from that pocket downstream of said baffles,
said second opening in each pocket being positioned along the annular axis of the rotary and whirling movement of the gases in that pocket,
said means for mounting said baffles comprising a plate provided with a plurality of openings for receiving and aligning one baffle in each of said openings,
each of said baffles being formed from a thin sheet of metal having its ends bent over to form flanges,
said baffles being formed in an arcuate configuration which extends through different openings in said plate with its end flanges overlapping parallel edges of the opening in which it is positioned whereby the arcuate configuration of said baffles form said pockets.

3,890,125
FILTER BAG
Vincent E. Schoeck, Hagerstown, Md., assignor to The Carborundum Company, Niagara Falls, N.Y.
Continuation of Ser. No. 182,974, Sept. 23, 1971, abandoned. This application Apr. 1, 1974, Ser. No. 457,020
Int. Cl. B01d *46/02*
U.S. Cl. 55—381 **4 Claims**



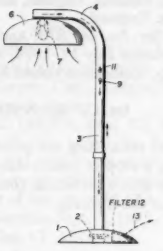
1. A filter bag for filtering solids from gases, said filter bag comprising a sheet of fabric of porous thermoplastic material having opposite edge portions of said fabric overlapped and joined together in a fused joint and defining a tubular body, said joint extending longitudinally along said tubular body, and said joint having essentially the same thickness as that of said sheet of fabric.

3,890,126
SMOKE LAMP DRAWING DEVICE
Donald B. Joseph, Venice, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed June 3, 1974, Ser. No. 475,885
Int. Cl. B01d *46/02*
U.S. Cl. 55—385 **2 Claims**

1. A smoke drawing device, comprising
a base housing of floor lamp type configuration having a drawing fan therein;
a tubular member of floor lamp type configuration supported substantially vertically by the base housing over the fan and communicating therewith, said tubular member being bent at substantially right angles to itself at its free end away from the base housing;

an outlet extending out of the base housing remote from the tubular member to an area spaced therefrom;

a lampshade type unit mounted on the tubular member at the free end thereof and opening into the tubular member in a manner whereby smoke in the area of the lampshade type unit is drawn by the fan through the tubular member and out through the outlet;



a smoke filter in the outlet for filtering smoke drawn therethrough; and

a lamp mounted to the free end of the tubular member in the lampshade type unit for illuminating an area around the lampshade type unit.

3,890,127

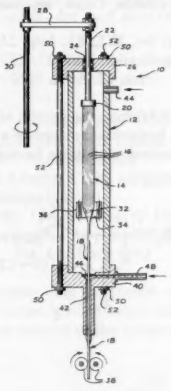
OPTICAL FIBER DRAWING APPARATUS

Walter P. Siegmund, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Division of Ser. No. 364,785, May 29, 1973, Pat. No. 3,837,824. This application June 6, 1974, Ser. No. 477,138

Int. Cl.[2] C03B *25/00*

U.S. Cl. 65—12 **5 Claims**



1. Apparatus for drawing a fused multiple fiber component comprising:

a hollow chamber within which an elongated bundle of light-conducting fibers may be suspended for heating and drawing into the fused multiple fiber component, said chamber having normally closed opposite ends at least one of which may be selectively opened for receiving a bundle of light-conducting fibers to be heated and drawn within said chamber;

heating means within said chamber;

a removable cover forming the closure for one end of said chamber;

a liquid gland in said cover, said liquid gland including an elongated orifice into which a multiple fiber component drawn from said bundle may be directed and extended outwardly of said chamber when said cover is in place on said chamber, said orifice being of a diametral size greater than that of a component to be drawn from said bundle, and said gland further including an inlet to said orifice from externally of said chamber through which a liquid sealant may be introduced into said orifice peripherally about a multiple fiber component being drawn therethrough for sealing said orifice against leakage of gas directed into said chamber under pressure; and

said chamber having inlet means for receiving and directing gas under pressure into said chamber.

3,890,128

METHOD OF TOUGHENING GLASS

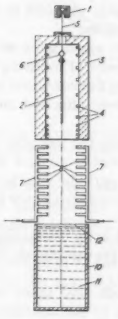
Richard Melling, Ormskirk; Donald Curtis Wright, Bolton, and John Pickup, Clyton-le-Mo Rs near Accrington, all of England, assignors to Pilkington Brothers Limited, Liverpool, England

Continuation of Ser. No. 802,151, Feb. 25, 1969, abandoned. This application June 21, 1971, Ser. No. 155,234

Claims priority, application United Kingdom, Feb. 27, 1968, 9484/68

Int. Cl. C03b *27/00*

U.S. Cl. 65—116 **7 Claims**



1. A method of toughening a glass sheet in which the glass is quenched in a chilling liquid to toughen the glass after a preliminary cooling of the glass surfaces by means of a cooling gas, which comprises:

a. heating the glass sheet to a selected high temperature near to its softening point;

b. effecting said preliminary cooling by passing the hot glass sheet at said selected high temperature at a selected rate of travel through a preliminary cooling region in which cooling gas flows are simultaneously directed against the opposite surfaces of the glass sheet uniformly over each surface at a flow rate sufficient

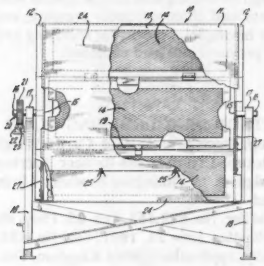
i. to retain substantially said selected high temperature in the center of the glass sheet up to the time of quenching in said chilling liquid, and

ii. to produce symmetrical temperature gradients from the center of the thickness of the glass sheet to both surfaces thereof sufficient to prevent deformation and fracture of the glass sheet as it is quenched in said chilling liquid; and

c. quenching the glass in the chilling liquid immediately after said preliminary cooling before any substantial re-

laxation of said symmetrical temperature gradients takes place.

3,890,129
AEROBIC/ANAEROBIC COMPOSTING DEVICE AND METHOD OF COMPOSTING
Francis B. Chester, 220 East 42nd St., Bayside, N.Y. 10017
Filed Dec. 14, 1972, Ser. No. 315,115
Int. Cl. C05f *11/08, 11/06*
U.S. Cl. 71—9 **3 Claims**



2. The method of composting organic waste material which comprises the steps of:

a. placing organic waste material in a rotatable container having open mesh sides;
b. covering said open mesh sides of the container with a removable outer cover of moisture excluding material;
c. periodically rotating the container about a horizontal axis with said outer cover attached and the waste material therein;
d. said rotation mixing the material in the container and exposing said material to contact with air;
e. discontinuing said periodic rotation of the container;
f. placing an inner second cover over the material within the container;
g. said inner cover directly contacting with the material in the container and preventing air from freely contacting said material;
h. then removing both said inner and outer covers and continuing rotation of the container with the covers removed;
i. said continued rotation effecting discharge of composted waste material from the container through the open mesh sides thereof.

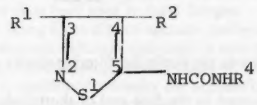
3,890,130
CHEMICAL TOPPING OF *BRASSICA OLERECEA*
Edwin Francis George, Eversley, and Alan John Davidson, Wokingham, both of England, assignors to Imperial Chemical Industries Limited, London, England
Continuation of Ser. No. 142,371, May 11, 1971, abandoned. This application Jan. 3, 1974, Ser. No. 430,420
Claims priority, application United Kingdom, May 22, 1970, 24826/70; July 6, 1970, 32672/70
Int. Cl.² A01N *9/20*
U.S. Cl. 71—76 **2 Claims**

1. A method of stimulating the growth of immature sprouts on the upper part of the stem of Brussels sprouts plants which comprises the foliar application to the plants of 2-m-chlorophenyl-carbamoyloxypropionic acid or a salt thereof in an amount sufficient to inhibit selectively the growth of the main apex in the plants but insufficient to cause substantial phytotoxic damage to other parts of the plants, said application being from 5 to 8 weeks prior to harvest and said salt being an alkali metal, alkaline earth metal, ammonium or alkyl amine salt wherein the alkyl contains up to 4 carbon atoms.

3,890,131
METHOD FOR CONTROLLING THE GROWTH OF WEEDS IN A COTTON GROWING AREA WITH 3,4,5-TRISUBSTITUTED ISOTHIAZOLES
David Buttimore, Benfleet, England, assignor to May & Baker Limited, Essex, England
Continuation of Ser. No. 241,833, April 6, 1972, abandoned. This application July 17, 1974, Ser. No. 489,250
Claims priority, application United Kingdom, Apr. 7, 1971, 9019/71
Int. Cl.² A01N *9/12*
U.S. Cl. 71—90 **23 Claims**

1. A method of controlling the growth of weeds in an area used for growing a crop of cotton which comprises

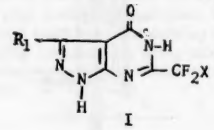
applying to the area a herbidical composition containing an isothiazole of the formula:



wherein R^1 is a straight- or branched-chain alkyl of 1 to 3 carbon atoms, R^2 is alkoxycarbonyl wherein the alkoxy moiety is straight- or chanched-chain and has from 1 to 5 carbon atoms, and R^4 is a straight- or branched-chain alkyl or alkenyl of up to 5 carbon atoms, or cyclopropyl, at a rate sufficient to control the growth of weeds without causing substantial permanent damage to the cotton.

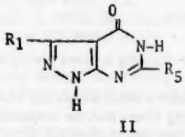
3,890,132
HERBICIDAL 1H-PYRAZOLO[3,4,-D]PYRIMIDIN-4-ONES
Beryl W. Dominy, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.
Division of Ser. No. 282,383, Aug. 21, 1972, Pat. No. 3,833,582. This application June 27, 1974, Ser. No. 483,692
Int. Cl. A01n *9/22*
U.S. Cl. 71—92 **10 Claims**

1. A method of inhibiting the growth of weeds, which comprises applying an herbicidal amount of a compound selected from the group consisting of those having the formulae



I

and



II

or the alkali metal, ammonia, mono-, di- or trialkylamine salts thereof wherein each of the alkyl groups has from 1 to 12 carbon atoms, wherein

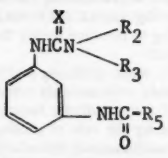
R_1 is selected from the group consisting of hydrogen and alkyl having from 1 to 4 carbon atoms;
X is selected from the group consisting of hydrogen, chloro, fluoro and $-CR_2R_3R_4$ wherein each of R_2, R_3 and R_4 is selected from the group consisting of hydrogen, chloro and fluoro; and
R_5 is alkyl having from 3 to 5 carbon atoms.

3,890,133
HERBICIDAL METHOD EMPLOYING META-ANILIDE UREA COMPOUNDS

Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 180,075, Sept. 13, 1971, Pat. No. 3,790,364, which is a division of Ser. No. 23,021, March 26, 1970, Pat. No. 3,642,891, which is a continuation-in-part of Ser. No. 746,007, July 19, 1968, abandoned, which is a continuation-in-part of Ser. No. 662,573, Aug. 23, 1967, abandoned. This application Sept. 7, 1973, Ser. No. 396,255
Int. Cl. A01n *9/20*
U.S. Cl. 71—99 **26 Claims**

1. A method for controlling the growth of vegetation which comprises applying to the area where control of said vegetative growth is desired, a growth controlling amount of a compound having the formula



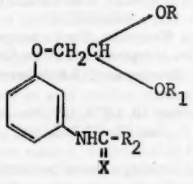
in which X is selected from the group consisting of oxygen and sulfur, R_2 is selected from the group consisting of hydrogen, alkyl, and lower alkoxy, R_3 is selected from the group consisting of alkyl, alkenyl and cycloalkyl, R_5 is selected from the group alkyl, and halogenated lower alkyl, provided that when X is oxygen and R_3 and R_5 are each alkyl then R_2 is other than hydrogen.

3,890,134
PHENOXY ACETALS AND THEIR UTILITY AS HERBICIDES

Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 124,541, March 15, 1971, Pat. No. 3,780,104. This application Aug. 3, 1973, Ser. No. 385,513
Int. Cl. A01n *9/12*
U.S. Cl. 71—100 **27 Claims**

1. A method for controlling the growth of vegetation which comprises applying to the locus wherein control is desired, an herbicidally effective amount of the compound of the formula



in which X is oxygen; R and R_1 are independently lower alkyl; R_2 is alkyl, or haloalkyl.

3,890,135
TRIFLUOROMETHYLBENZOPHENONE O-ACYLOXIMES AND THEIR USE AS CROP YIELD INCREASERS FOR PLANTS

William Joseph Middleton, Chadds Ford, Pa., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

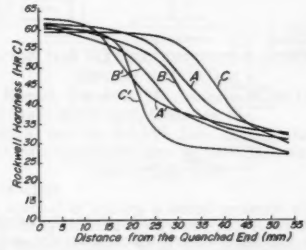
Division of Ser. No. 324,878, Jan. 18, 1973, Pat. No. 3,849,494. This application Apr. 19, 1974, Ser. No. 462,396
Int. Cl. A01n *9/20*
U.S. Cl. 71—121 **3 Claims**

1. A method of increasing crop yield in plants comprising the step of applying to plants an effective crop yield increasing amount of 4-trifluoromethylbenzophenone O-acetyloxime.

3,890,136
RAW POWDERS TO BE USED FOR PRODUCTION OF LOW ALLOYS STEELS HAVING AN EXCELLENT HARDENABILITY BY POWDER METALLURGY

Shunji Ito, Chiba; Yasuaki Morioka, Ohami; Yoshihiro Kajinaga; Minoru Nitta, both of Chiba, and Ichio Sakurada, Ichihara, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed July 1, 1974, Ser. No. 484,945
Claims priority, application Japan, July 5, 1973, 48-75299
Int. Cl. B22f *9/00*
U.S. Cl. 75—0.5 BA **6 Claims**



1. Raw powders to be used for production of low alloy steels having an excellent hardenability by powder metallurgy, which consisting mainly of 0.90–2.50% by weight of Mn, 0.35–1.50% by weight of Cr, 0.10–1.00% by weight of Mo, not more than 0.10% by weight of Si and remainder substantially being Fe, provided that the sum of Mn and Cr is 1.70–3.10% by weight.

3,890,137
WELDING POWDER FOR PRODUCING WEAR-RESISTANT LAYERS BY BUILD-UP WELDING

Horst Beyer, and Ulrich Buran, both of Burscheid, Germany, assignors to Goetzewerke-Friedrich Goetze AG, Burscheid, Germany

Filed Mar. 15, 1974, Ser. No. 451,678
Claims priority, application Germany, Mar. 15, 1973, 2312810
Int. Cl. C22c *1/05, 27/00*
U.S. Cl. 75—.5 BB **13 Claims**

1. A welding powder for producing wear-resistant layers by build-up welding, consisting essentially of:
a. a first component selected from the group consisting of molybdenum powder, tungsten powder, an alloy of molybdenum and tungsten in powder form, and a mixture of molybdenum powder and tungsten powder; and
b. a second component of at least one element selected from the group consisting of oxygen, nitrogen, hydrogen and carbon, said second component being present partly in a free, unbound, dissolved state; and
when oxygen is present as the welding powder, it is present in an amount of about 0.001 to about 12 percent by

weight, with the free oxygen content being from about 0.00001 to about 0.12 weight percent;

when nitrogen is present in the welding powder, it is present in an amount of about 0.001 to about 0.5 percent by weight, with the free nitrogen content being from about 0.00001 to about 0.00005 weight percent; when hydrogen is present in the welding powder, it is present in an amount of about 0.001 to about 0.5 percent by weight, with the free hydrogen content being from about 0.00001 to about 0.005 weight percent; and when carbon is present in the welding powder, it is present in an amount of about 0.01 to about 2.5 percent by weight, with the free carbon content being from about 0.003 to about 0.8 weight percent.

3,890,138

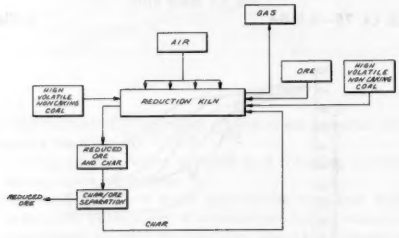
REDUCTION OF IRON-CONTAINING ORES

Harry William Hockin, Capel, Australia, assignor to Western Titanium N.L., Australia

Continuation of Ser. No. 190,671, Oct. 19, 1971, abandoned. This application Oct. 17, 1973, Ser. No. 407,156

Int. Cl. C21b *13/08*

U.S. Cl. 75—33 **5 Claims**



1. A process comprising reducing fine ore containing iron in a rotary kiln fitted with air injection devices, and having a discharge end, a feed end zone and a bed, said process further comprising using a high volatile non-caking coal as the reductant and the fuel, and adding part of the coal at the discharge end of the kiln in such a manner that substantially no coal is incorporated in the bed within at least the last 20% of the kiln length and so that some of the coal added at the discharge end of the kiln is distributed to within the feed end zone of the kiln, the remainder of the coal being added at the feed end of the kiln, the amount of coal fed into the kiln at the discharge end being about 20–30% by weight of the total coal feed, said iron being metallized to at least about 95%.

3,890,139

CONTINUOUS PROCESS FOR REFINING SULFIDE ORES

Takashi Suzuki, Urawa, and Kazuo Tachimoto, Tokyo, both of Japan, assignors to Mitsubishi Kizoku Kabushiki Kaisha, Tokyo, Japan

Filed May 1, 1973, Ser. No. 356,172

Claims priority, application Japan, May 4, 1972, 47-44302

Int. Cl. C22b *15/00*

U.S. Cl. 75—74 **4 Claims**

1. A method for the continuous production of blister copper from sulfide copper ores in a smelting furnace unit, a separator furnace unit and an oxidizing furnace unit, each controllable in operation independently of the other as to compositions of melts therein, temperatures, levels of free surfaces of corresponding melts, and the thickness of the layers of the individual melts in the separator furnace unit and the oxidizing furnace unit including the corresponding slag therein, and wherein the rates of production of slag, matte and blister copper, the rate of transfer of matte from the separator furnace unit to the oxidizing furnace unit and the rates of transfer of blister copper and slag out of the oxidizing furnace unit are maintained in constant equilibrium with the rate of transferring smelted inputs from the smelting furnace unit to the separator furnace unit, which method comprises the steps of:

a. continuously smelting in the smelting furnace unit inputs of sulfide copper ores, flux and oxygen-containing gas to yield a lower layer of matte and an upper layer of slag;

b. simultaneously, while smelting said inputs, continuously transferring said matte and slag in admixture from said smelting furnace unit to a separator furnace unit, at a rate of transfer balancing the rate of production of matte and slag, wherein the matte and the slag are permitted to separate;

c. continuously transferring slag out of said separator furnace unit for disposal at a rate balancing the rate of transfer of slag from the smelting furnace and continuously transferring matte out of said separator furnace unit to an oxidizing furnace unit at a rate of transfer balancing the rate of transfer of matte from the smelting furnace, both rates of transferring matte and slag being equal to the rate of transferring said matte and slag in admixture from the smelting furnace unit to the separator furnace unit by retaining a constant thickness of slag layer and a constant thickness of matte layer in the separator furnace unit, such that a definite amount of the matte is continuously transferred to said oxidizing furnace unit, which amount is equal to the amount transferred to the separator;

d. introducing into said oxidizing furnace unit, flux and an oxygen-containing gas to convert said matte to blister copper and slag to produce layers thereof in said oxidizing furnace; and

e. simultaneously, while oxidizing said matte in said oxidizing furnace unit, continuously transferring said blister copper out of said oxidizing furnace unit at a rate of transfer balancing the rate of production of said blister copper and simultaneously transferring said slag out of said oxidizing furnace unit at a rate balancing the rate of production of the slag in said oxidizing furnace unit, both rates of transferring the blister copper and the slag produced in said oxidizing furnace unit being balanced to the rate of feeding said matte, flux and oxygen-containing gas to said oxidizing furnace unit by retaining in said oxidizing furnace unit a constant thickness of the slag layer and a constant thickness of the blister copper layer, and the rates of transferring said blister copper and said slag out of said oxidizing furnace unit thereby being balanced to the rate of transferring said matte and slag in admixture out of the smelting furnace unit to the separator furnace unit.

3,890,140

ALUMINUM TITANATE CRUCIBLE FOR MOLTEN URANIUM

Joseph J. Asbury, Knoxville, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 10, 1973, Ser. No. 359,052

Int. Cl. C22b *61/04*

U.S. Cl. 75—84.1 R **4 Claims**

1. A method of limiting adverse contamination of uranium and uranium alloys during molten states thereof by the step of melting the uranium alone or with uranium alloying metals in a crucible or crucible liner composed of aluminum titanate.

3,890,141

CONVERSION OF SCRAP RUBBER TO FUEL AND USEFUL BY-PRODUCTS

Grant Crane; Edward L. Kay, and Joseph R. Laman, all of Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Nov. 15, 1973, Ser. No. 416,132
Int. Cl. C08c *17/38*; C08d *17/00*; C08c *17/00*
U.S. Cl. 75—86 10 Claims

1. The method of treating solid waste vulcanized rubber by the steps of

heating the solid waste vulcanized rubber in contact with from about 10 up to about 1,000 percent of a hydrocarbon liquid at 400° to 800°F. for 0.1 to 50 hours to convert the solid waste vulcanized rubber to a fluid,

transferring the fluid thus produced to combustion apparatus,

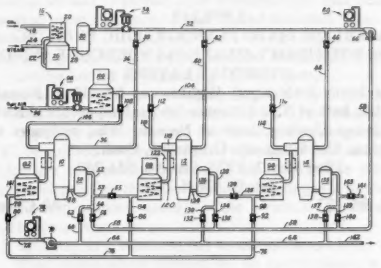
burning the fluid, producing heat energy and ash, and collecting the ash and recovering zinc and titanium therefrom.

3,890,142

METHOD FOR GASEOUS REDUCTION OF METAL ORES

Juan Celada, and Patrick W. MacKay, both of Monterrey, Mexico, assignors to Fierro Esponja, S.A., Monterrey, Mexico

Filed Oct. 16, 1973, Ser. No. 406,805
Int. Cl. C21b *13/02*
U.S. Cl. 75—91 9 Claims



1. In a method for the batchwise gaseous reduction of metal oxides to metals in a multiple unit reactor system of the type in which separate bodies of metal-bearing material are simultaneously treated in one or more charging reactors, reduction reactors, and cooling reactors and a reducing gas is passed successively through said cooling and reduction reactors, the improvement which comprises passing a cool reducing gas composed largely of carbon monoxide and hydrogen through a body of largely reduced metal oxide in a cooling reactor, cooling the effluent gas from said cooling reactor, recirculating a portion of the cooled effluent gas through the body of reduced metal oxide in said cooling reactor, heating the remainder of said cooled effluent gas to a temperature of 900° to 1100°C., passing said heated gas through a body of metal oxide in a reduction reactor, recirculating to said reduction reactor a portion of the effluent gas from said reduction reactor mixed with said remainder of said effluent gas from said cooling reactor, and removing the remainder of the effluent gas from said reduction reactor from said system.

3,890,143

WELDED CONSTRUCTIONS OF STAINLESS STEELS

Eric Skoglund, Torshalla, and Olle Jarleborg, Soderfors, both of Sweden, assignors to Nyby Bruk AB, Nybybruk, Sweden

Filed Apr. 12, 1973, Ser. No. 350,655
Int. Cl. C22c *39/20*
U.S. Cl. 75—125 7 Claims

1. An article comprising at least one welded sheet of stainless chromium steel consisting essentially of

C	not more than	0.03%
N_2	not more than	0.03%
Cr		17 to 25%
Ni	not more than	0.5%
Cu	not more than	0.2%
Si		0.3 to 0.6%
Mn		0.3 to 0.6%
Mo		1 to 4%
Ti		0.2 to 0.66%

the balance being iron and incidential impurities, percentages being by weight.

3,890,144

PROCESS FOR MAKING IMPROVED STRENGTH DENTAL AMALGAM

David A. Hansen, Columbia, Mo., assignor to The Curators of the University of Missouri, Columbia, Mo.

Division of Ser. No. 264,619, June 20, 1972, Pat. No. 3,841,467. This application May 20, 1974, Ser. No. 471,490
Int. Cl. C22c *7/00*
U.S. Cl. 75—169 3 Claims

1. The method of making a dental amalgam which comprises combining mercury and a particulate dental alloy, used in making dental amalgam, in an inert atmosphere.

3,890,145

PROCESSES FOR THE MANUFACTURE OF TUNGSTEN-ASED ALLOYS AND IN THE CORRESPONDING MATERIALS

André R. Hivert, Pontoise, and Philippe M. Galmiche, Clamart, both of France, assignors to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.), Chatillon-Sous-Bagneux, France

Filed Oct. 26, 1970, Ser. No. 90,220
Claims priority, application France, Oct. 28, 1969, 69.36877
Int. Cl. B22f *3/16*
U.S. Cl. 75—224 14 Claims

1. Process for the manufacture of tungsten-based alloys, comprising forming a mixture of very fine tungsten powder with a metallic binder and sintering said mixture in a non-oxidizing, halogenated atmosphere, said binder occurring in the liquid state at the sintering temperature and being constituted by a very fine powder, containing as the only three constituents 65 to 90% of nickel, 5 to 20% of chromium and 5 to 15% of phosphorus, the phosphorus being introduced in the form of an alloy powder containing one at least of the two other constituents of the binder.

3,890,146

ORGANIC PHOTOCONDUCTIVE MATERIALS DERIVED FROM REACTING A PHOTOCONDUCTIVE COMPOUND WITH A COLOR COMPOUND

Shinichiro Nagashima, and Kaichi Tsuchiya, both of Tokyo, Japan, assignors to Canon Inc., Japan

Division of Ser. No. 325,258, Jan. 22, 1973, Pat. No. 3,844,781, which is a division of Ser. No. 888,886, Dec. 29, 1969, Pat. No. 3,721,554. This application May 6, 1974, Ser. No. 467,521

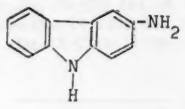
Claims priority, application Japan, Dec. 30, 1968, 44-96504; May 12, 1969, 44-36431

Int. Cl. G03g 5/04

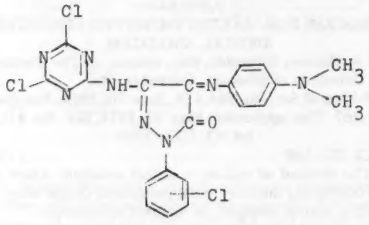
U.S. Cl. 96—1.5 3 Claims

1. A light transparent photoconductive material for use in electrophotography which is the reaction product obtained by condensing

a. an organic photoconductive compound of the formula



b. a colored substance of formula



3,890,147

LIGHT ACTIVATING IMAGING PROCESS

Alan R. Monahan, East Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

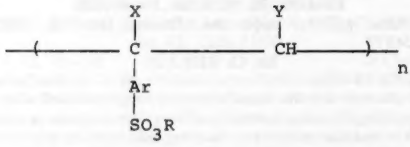
Division of Ser. No. 245,276, April 18, 1972, Pat. No. 3,834,906. This application May 29, 1974, Ser. No. 474,273

Int. Cl. G03c 5/04

U.S. Cl. 96—27 R 2 Claims

1. A display process comprising:

a. coating the surface of a support substrate with a layer of alkyl esters of polyvinylaryl sulfonic acids said esters satisfying the formula:



wherein R may be any straight or branched chain alkyl group including halogen substituted groups up to and including ten carbon atoms;

wherein *n* is an integer having a value of from 10 to infinity; X and/or Y are hydrogen, halogen, alkyl or halogen substituted alkyl groups;

wherein Ar may be any polynuclear aromatic fused ring hydrocarbon up to and including 5 benzene rings;

b. selectively exposing said polymer to actinic radiation so as to insolubilize said exposed areas and produce a translucent image; and

c. projecting said image.

3,890,148

EXPOSURE OF LIGHT-SENSITIVE MATERIALS

Leslie Edward Lawson, and Peter John Smith, both of Orpington, England, assignors to Howson-Algraphy Limited, Kent, England

Continuation-in-part of Ser. No. 167,825, July 30, 1971, abandoned. This application Feb. 15, 1973, Ser. No. 332,592

Int. Cl.[2] G03F 7/02

U.S. Cl. 96—33 8 Claims

1. A method of exposing a layer of positive-working photosensitive material which comprises assembling together a plurality of positive films to produce an image, preparing a mask by providing a sheet of actinic light transmitting material coated with a composition which does not transmit actinic light, said coated sheet being visible light transmitting, and painting parts of said composition with a liquid which interacts with said composition to permitactinic light to be transmitted through said sheet and thereby to form on the sheet an actinic light transmitting pattern corresponding to the pattern defined by the edges of the films in the assembly, and exposing the layer to actinic light through said mask either before or after subjecting the layer to an image-forming exposure through the assembly.

7. A method according to claim 1, wherein the layer of photo-sensitive material forms part of a photo-sensitive plate suitable for the production of a lithographic printing plate.

3,890,149

WATERLESS DIAZO PLANOGRAPHIC PRINTING PLATES WITH EPOXY-SILANE IN UNDERCOAT AND/OR OVERCOAT LAYERS

Sheldon Irwin Schlesinger, Hightstown; Ronald J. Boszak, Trenton, both of N.J.; Laurence Verlan Shuppert, and Richard James Cowling, both of Neenah, Wis., assignors to American Can Company, Greenwich, Conn.

Filed May 2. 1973, Ser. No. 356,282

Int. Cl. G03f 7/08

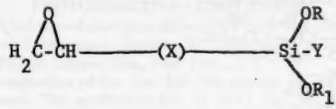
U.S. Cl. 96—33 40 Claims

1. A presensitized planographic printing plate capable of being imaged comprising a substrate having applied to at least one surface thereof:

1. as an undercoat layer, a sensitized composition comprising an epoxy-silane, a monomeric or prepolymeric epoxide material polymerizable to higher molecular weights through the action of a cationic catalyst, and, as a catalyst

precursor, radiation-sensitive aromatic diazonium salt of a complex halogenide which decomposes upon application of energy to release a Lewis acid effective to initiate polymerization and interaction of said epoxide and epoxy-silane and

2. as an overcoat layer, an abhesive compisition comprising an organosiloxane and from 0 to 50 percent of an epoxy-silane as based on the total weight of the components in the overcoat layer said epoxy-silane in said layers being selected from compounds having the general formula



with the proviso that (1) when said overcoat layer composition is devoid of epoxy-silane, said undercoat layer composition contains about 25 to about 75 percent epoxy-silane and about 15 to about 40 percent of said catalyst precursor, and (2) when said epoxy-silane is a component of said overcoat layer composition, said undercoat layer composition contains about 1 to about 20 percent epoxy-silane and about 0.5 to about 10 percent of said catalyst precursor, all percents being based on the total weight of said epoxide material in said undercoat layer except the percent of said catalyst precursor in proviso (2) is based on the total weight of epoxide moiety containing compounds in said undercoat layer

wherein each of X, r and R_1 is an alkylene, alkoxy, arylene, alakarylene, aralkylene, carbalkoxy or ether group and Y is an alkoxy or epoxy group; said undercoat layer becoming firmly bonded to said overcoat layer throughintra- and inter-layer reaction upon exposure of said coated substrate to an energy source.

said organosiloxane being silicone elastomer formed by curing and/or polymerizing silicone gum;

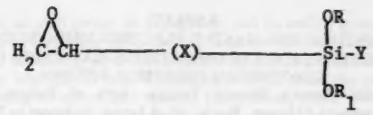
said undercoat layer becoming firmly bonded to said overcoat layer through intra- and inter-layer reaction upon exposure of said coated substrate to an energy source.

27. A method for production of planographic printing plates which are suitable for accepting ink only in the oleophilic areas and printing therefrom while rejecting ink in the oleophobic non-printing areas, in the absence of dampening, which comprises:

1. applying to a substrate (a) as an undercoat layer a sensitized composition comprising an epoxy-silane, a monomeric or prepolymeric epoxide polymerizable to higher molecular wights through the action of a cationic catalyst and, as a catalyst precursor, a radiation-sensitive aromatic diazonium salt of a complex halogenide which decomposes upon application of energy to release a Lewis acid effective to initiate polymerization and interaction of said epoxide and epoxy-silane and (b) as an overcoat layer a composition comprising an organosiloxane and from 0 to 50 percent of an epoxy-silane as based on the total weight of the components in the overcoat layer;

with the proviso that (1) when said overcoat layer composition is devoid of epoxy-silane, said undercoat layer composition contains about 25 to about 75 percent epoxy-silane and about 15 to about 40 percent of said catalyst precursor, and (2) when said epoxy-silane is a component of said overcoat layer composition, said undercoat layer composition contains about 1 to about 20 percent epoxy-silane and about 0.5 to about 10 percent of said catalyst precursor, all percents being based on the total weight of said epoxide material in said undercoat layer except the percent of said catalyst precursor in proviso (2) is based on the total weight of epoxide moiety containing compounds in said undercoat layer

said epoxy-silane in said layers being selected from compounds having the general formula



wherein each of X, R and R_1 is an alkylene, alkoxy, arylene, alkarylene, aralkylene, carbalkoxy or ether group and Y is an alkoxy or epoxy group; and

said organosiloxane being silicone elastomer formed by curing and/or polymerizing silicone gum;

2. exposing at least a portion of said coated substrate to an energy source through an article having opaque and transparent areas to effect said polymerization and interaction and to render the exposed areas of said coated substrate insoluble and

3. removing said unexposed areas of said coated substrate.

3,890,150

PHOTOSENSITIVE COMPOSITIONS INCLUDING AROMATIC BIS-ACRYLIC DERIVATIVES

Masaki Hasegawa, Tokyo; Fusae Nakanishi, Yokohama; Hachiro Nakanishi, Yokohama; Shoji Watanabe, Yokohama; Yasuzo Suzuki, Yokohama; Hisashi Nakane, Kawasaki; Toshimi Aoyama; Yukio Komatsubara, both of Tokyo; Setsuo Nojima, Kawasaki, and Hiroshi Tagami, Yokohama, all of Japan, assignors to Director-General, Agency of Industrial Science & Technology Co. Ltd., Tokyo and Tokyo Ohka Kogyo Co., Ltd., Kanagawa, both of, Japan

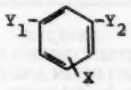
Continuation of Ser. No. 149,771, June 3, 1971, abandoned. This application Sept. 19, 1973, Ser. No. 398,825

Claims priority, application Japan, June 3, 1970, 45-48345; June 3, 1970, 45-48346

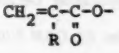
Int. Cl. G03c *1/70*

U.S. Cl. 96—33 **5 Claims**

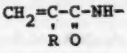
1. A photosensitive polymer composition for insolubilization by exposure to actinic light which consists essentially of a mixture in a molar ratio of about 10:1–1:2 by weight of a solvent-soluble linear polyamide and a meta-phenylene bis-acrylic derivative of the general formula:



wherein Y_1 and Y_2 each represent a



or a



group where R and X each stands for a hydrogen atom or a lower alkyl group.

3,890,151
METHOD FOR MAKING ELECTROLUMINESCENT SCREENS FOR COLOR CATHODE-RAY TUBES OF CONTINUOUS PHOSPHOR STRIPES

Takeshi Suzuki; Hiroshi Tanaka, both of Fukaya, and Masanori Akiyama, Honjo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Aug. 7, 1973, Ser. No. 386,317
Claims priority, application Japan, Aug. 7, 1972, 47-78420
Int. Cl. G03c *5/00*
U.S. Cl. 96—36.1 **6 Claims**

1. In a method of making an electro-luminescent screen for a color cathode ray tube comprising a plurality of separate color fields of continuous vertical stripes disposed on the viewing panel of said electroluminescent screen, each of said color fields being defined by exposure of said panel to a light source through a shadow mask, the light projected through said mask onto said panel producing a developable image of each said color fields on said panel, the steps comprising:

a. applying a film containing photosensitive material having a predetermined solvency in response to incident light onto the panel for the cathode-tay tube;

b. attaching to said panel a shadow mask with a concave face having a number of beam-passable apertures arranged in rows substantially parallel with each other, said apertures along the length of each of said rows being separated from each other by beam-intercepting bridge portions;

c. locating a light source to irradiate an area of said shadow mask on the opposite side of said shadow mask at a position representing the location of the electron gun in said cathode ray tube used to illuminate each said color field, projecting the light from said source through said mask on said film on said panel in a pattern comprising images defined by said apertures of said shadow mask, controlling the light projected by said light source to limit said lighted area in length in the direction of said rows of apertures, the apertures within said lighted area having a nearly equal angle of inclination with respect to the vertical axis of said screen, said light source having a sufficient effective length to produce on said film an image of each aperture so expanded in the lengthwise direction of the rows of the apertures as to overlap the image of each adjacent aperture in the lengthwise direction of each of the rows thereby obtaining images of the continuous vertical stripes of each said color field along the length of each of said rows on said panel film, and

d. controlling said light source to move said irradiated area on the shadow mask along the length of the rows of the apertures while inclining said light source to keep the longitudinal axis thereof substantially parallel to a line drawn tangent to the apertures in the irradiated area of said shadow mask.

3,890,152
LIGHT-SENSITIVE COPYING COMPOSITION CONTAINING DIAZO RESIN AND QUINONE DIAZIDE

Hans Ruckert, Wiesbaden-Schierstein, and Rainer Unholz, Wiesbaden-Biebrich, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

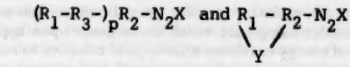
Filed Sept. 21, 1972, Ser. No. 291,095
Claims priority, application Germany, Sept. 25, 1971, 2147947
Int. Cl. G03f *7/08*
U.S. Cl. 96—75 **4 Claims**

1. A light-sensitive composition comprising, in a homogeneous admixture, (I) at least one diazonium salt mixed condensation product comprising repeating units of each of the general types

A—N_2X and B

which are linked by methylene groups, in which

A—N_2X is a radical of a compound of one of the general formulae



wherein

R_1 is an arylene group of the benzene or naphthalene series,

R_2 is a phenylene group,

R_3 is a simple homopolar bond or one of the groups

$-(CH_2)_q-NR_4-$,

$-O-(CH_2)_r-NR_4-$

$-S-(CH_2)_r-NR_4-$

$-S-CH_2-CO-NR_4-$

$-O-R_5-O-$

$-O-$

$-S-$ or

$-CO-NR_4-$

the left-hand free valence of the specified groups is attached to R_1 and the right-hand free valence is attached to R_2,

q is a number from 0 to 5

r is a number from 2 to 5

R_4 is selected from the group consisting of hydrogen, alkyl with 1 to 5 carbon atoms, aralkyl with 7 to 12 carbon atoms, and aryl with 6 to 12 carbon atoms,

R_5 is an arylene group having 6 to 12 carbon atoms

—Y— is one of the groups

—NH—, and —O—

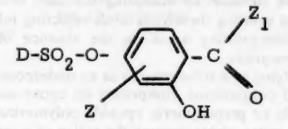
X is the anion of the diazonium compound, and

p is a number from 1 to 3, and

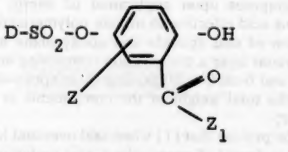
B is a radical of a compound free of diazonium groups selected from the group consisting of aromatic amines, phenols, thiophenols, phenol ethers, aromatic thioethers, aromatic heterocyclic compounds, aromatic hydrocarbons and organic acid amides,

which condensation product contains, on the average, about 0.01 to 50 B units per unit of A—N_2X,

and (II) at least one compound selected from the group consisting of (a) an o-naphthoquinone diazide sulfonic amide derived from a primary aliphatic amine with two to nine carbon atoms, (b) an o-naphthoquinone diazide sulfonic ester of one of the general formulae



and



wherein

D is a naphthoquinone (1,2)-diazide residue;

Z is H or OH;

Z_1 is H, OZ_2, NZ_3Z_4 or alkyl, aryl or heteroyl;

Z_2 is alkyl or aryl;

and Z_3 and Z_4 are H, alkyl or aryl, and

(c) the 4-cumyl-phenylester of naphthoquinone-(1,2)-diazide-(2)-4-sulfonic acid, the components (I) and (II) being present in quantities such that 0.5 to 4 diazide groups are present per diazonium salt group

wherein said composition when used as a supported light-sensitive layer is capable, after imagewise exposure to actinic light, of forming a positive or negative image in the same said layer dependent only on choice of developer, and wherein said positive image is formed using an aqueous alkaline developer and said negative image is formed using an aqueous acidic developer.

3,890,153
POSITIVE-ACTING NAPTHOQUINONE DIAZIDE PHOTOSENSITIVE COMPOSITION

Rinse Dijkstra, and Arnoldus Johannes Maria Van den Broek, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 233,760, March 10, 1972, abandoned. This application Dec. 6, 1973, Ser. No. 422,585

Claims priority, application Netherlands, Mar. 13, 1971, 7103379

Int. Cl. G03f 7/08; G03c 1/54

U.S. Cl. 96—91 D **4 Claims**

1. A positive-acting photosensitive composition comprising a solution in admixture of a naphthoquinone-(1,2)-diazido-(2) and a film forming polyvalent alcohol resin in admixture in an organic solvent, said film-forming resin having a softening point between 50℃ and 95℃ and being obtained by the esterification of 40% to 60% of groups available for esterification of a polyvalent epoxide compound with a hydroxyphenyl-monocarboxylic acid.

3,890,154
LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIALS

Kinji Ohkubo; Junpei Noguchi; Kunioki Ohmura, and Masanao Hinata, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 101,233, Dec. 24, 1970, abandoned. This application Mar. 23, 1973, Ser. No. 344,401

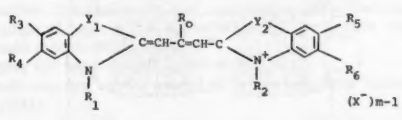
Claims priority, application Japan, Dec. 24, 1969, 44-104009; Jan. 9, 1970, 45-002819

Int. Cl. G03c 1/08

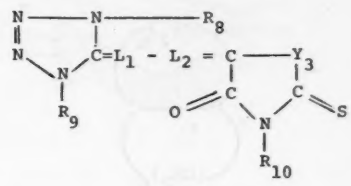
U.S. Cl. 96—125 **23 Claims**

1. A light-sensitive silver halide photographic material comprising at least one layer having high sensitivity to green light under flash exposure on a support which comprises an emulsion consisting essentially of:

1. a binder,
2. light-sensitive silver halide grain particles of homogeneous structure exhibiting high surface sensitivity, compared to core-shell type particles,
3. at least one simple salt or complex salt of a Group VIII metal selected from the group consisting of iron, cobalt, nickel, ruthenium, rhodium, palladium, osmium, iridium and platinum, and
4. at least one optical sensitizer selected from the group consisting of compounds of the general formula:



wherein R_0 is a member selected from the group consisting of a hydrogen atom and an alkyl group; wherein R_1 and R_2 each represents a member selected from the group consisting of a hydrogen atom, an alkyl group of from 1 to 4 carbon atoms, a substituted alkyl group selected from the group consisting of a hydroxyalkyl group, an acetoxyalkyl group, an alkyl group having a carboxy group and an alkyl group having a sulfa group, an allyl group, an aryl group, and an aralkyl group, in which at least one of R_1 and R_2 must be selected from the group consisting of a carboxyalkyl group and a sulfoalkyl group; wherein Y_1 and Y_2 each is selected from the group consisting of an oxygen atom, a sulfur atom, and a =N—R_7 group, in which R_7 represents an alkyl group; wherein R_3, R_4, R_5 and R_6 each is selected from the group consisting of a hydrogen atom, a halogen atom, an alkyl group, a cyano group, an alkoxy group, and an aryl group, in which if at least one R_3 and R_4 is an aryl group, then R_5 and R_6 are not an aryl group; wherein X represents an anion selected from the group consisting of a halogen ion and a thiocyanate iron; and wherein m represents an integer of 1 or 2, in which an intramolecular salt is formed if m is 1; and compounds of the formula:



wherein R_8, R_9 and R_{10} each represents a member selected from the group consisting of a hydrogen atom, an alkyl group of from 1 to 8 carbon atoms, a substituted alkyl group selected from the group consisting of a carboxyalkyl group, a hydroxyalkyl group and a sulfoalkyl group, wherein Y_3 is a member selected from the group consisting of an oxygen atom, a sulfur atom, and a =N—R_{11} group in which R_{11} is a member selected from the group consisting of a hydrogen atom, an alkyl group, and an aryl group, and wherein L_1 and L_2 each represents a methine chain.

3,890,155
RADIATION-SENSITIZED FINE-GRAINED SILVER HALIDE PHOTOGRAPHIC SENSITIVE MATERIAL

Yasuharu Nakamura; Yoshiyuki Nakazawa; Tohru Sueyoshi, and Akira Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

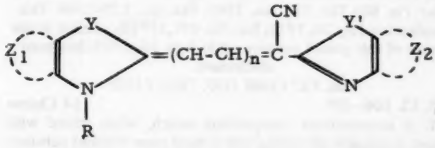
Filed Apr. 12, 1973, Ser. No. 350,579

Claims priority, application Japan, Apr. 12, 1972, 47-36676

Int. Cl. G03c 1/18, 1/20

U.S. Cl. 96—137 **20 Claims**

1. A radiation-sensitive silver halide photographic emulsion containing silver halide crystals whose mean grain size is not greater than **0.2** micron or at least **90%** in number of which are not greater than **0.25** micron in grain size and at least one sensitizing base represented by the following general formula (I);



(I)

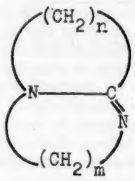
wherein Z_1 and Z_2 each represent the atoms necessary to form a benzene ring, Y represents an oxygen atom, a sulfur atom, a selenium atom or a >N—R_1 group, Y′ represents a sulfur atom, a selenium atom or a >N—R_3 group, R_1 and R_2 which may be the same or different each represents an alkyl group, R_3 represents a hydrogen atom or an alkyl group, and n represents 1 or 2, said sensitizing base enhancing both the spectral sensitivity and the sensitivity in the absorption wave length region intrinsic to said silver halide.

3,890,156
DESENSITIZER COMPOSITIONS

Hiroharu Matsukawa; Akio Miyamoto, and Akio Watanabe, all of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed June 4, 1973, Ser. No. 367,061
Claims priority, application Japan, June 3, 1972, 47-55470
Int. Cl. C09d 11/00
U.S. Cl. 106—19 24 Claims

1. In a desensitizer composition for desensitizing a developer against coloring a colorless color former, which comprises an inorganic pigment, a resin binder and a desensilizing agent; the improvement comprising, as said agent at least about 1 weight percent, based on the composition weight, of an amine of the folllowing formula or a salt thereof:



wherein *m* is an integer of 2–6, *n* is an integer of 2–11, and each ring can be substituted by one or more alkyl groups of 1–4 carbon atoms.

3,890,157
CEMENTITIOUS SYSTEMS INCORPORATING PARTICULATE ADSORBENTS

Henry Nash Babcock, 4 Quintard Ave., Old Greenwich, Conn. 06870

Continuation-in-part of Ser. No. 328,498, Jan. 31, 1973, abandoned, which is a continuation-in-part of Ser. Nos. 303,984, Nov. 6, 1972, abandoned, and Ser. No. 709,229, Feb. 29, 1968, abandoned, said Ser. No. 303,984, is a division of Ser. No. 801,781, Feb. 24, 1969, Pat. No. 3,794,504. This application July 24, 1974, Ser. No. 491,317The portion of the term of this patent subsequent to Feb. 26, 1991, has been disclaimed.
Int. Cl.[2] C04B 1/00, 7/02, 11/00
U.S. Cl. 106—89 14 Claims

1. A cementitious composition which, when mixed with water, is capable of setting into a hard mass without substantial shrinkage during setting and early hardening, said composition comprising a hydraulic cement mixture and a dry adsorbent-like porous particulate solid material with an internal porosity in excess of 25 percent, an external void fraction above 35 percent and a surface area in excess of 100 m^2/g, having a volume of entrapped gas within its pores and capable of preferentially adsorbing water and controllably discharging the entrapped gas during setting and early hardening of said cement mixture while in contact with water, in an amount effective to counteract the shrinkage tendency of the cementitious composition.

3,890,158
WAX EMULSIONS FOR CONTROLLING TRANSPIRATION IN PLANTS

Donald R. Cushman, Wenonah; Edward A. Oberright, Woodbury, both of N.J.; Roy T. Edwards, deceased, late of Mullica Hill, N.J., and by Katherine Edwards, legal representative, Mullica Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 256,997, May 25, 1972, Pat. No. 3,791,839, which is a continuation-in-part of Ser. No. 60,957, July 2, 1970, abandoned, which is a division of Ser. No. 639,041, May 17, 1967, abandoned. This application Oct. 18, 1973, Ser. No. 407,706
Int. Cl. C08h 9/06
U.S. Cl. 106—271 5 Claims

1. A wax emulsion composition consisting essentially of, by weight, from about 15 to about 40% paraffin wax having a melting point of from about 115°F. to about 190°F.; from about 5 to about 30% petrolatum; from about 2 to about 10% of an emulsifier comprising a mixture of sorbitan monooleate and polyoxyethylene sorbitan monooleate or their stearates and at least one member of the group consisting of alkali metal and morpholine soaps; and water in an amount sufficient to form the emulsion.

3,890,159
METHOD OF FORMING A HIGH SURFACE AREA METALLIC CADMIUM POWDER AND AN ELECTRODE THEREFROM

Roy F. Thornton, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

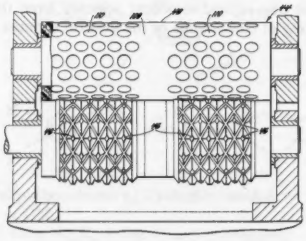
Filed Dec. 4, 1972, Ser. No. 311,866
Int. Cl. H01m 43/04
U.S. Cl. 136—24 7 Claims

1. A method of forming a high surface area metallic cadmium powder which consists of mixing together cadmium oxide powder, and zinc powder in an aqueous alkali hydroxide solution to form a slurry, reaacting the mixture thereby forming metallic cadmium powder and oxidized zinc species, washing the metallic cadmium powder and oxidized zinc species with a second aqueous alkali hydroxide solution thereby removing the oxidized zinc species, washing the metallic cadmium powder thereby removing the alkali hydroxide, and drying the metallic cadmium powder.

3,890,160
METHOD AND APPARATUS FOR PREVENTING CURLING OF LEAD STRIPS DURING EXPANSION

Elon Daniels, Jr., Frankton, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 20, 1973, Ser. No. 399,108
Int. Cl. H01m 35/04
U.S. Cl. 136—36 2 Claims



1. A method of making lead-acid storage battery plates comprising:

advancing a narrow lead strip, having a predetermined thickness, longitudinally between two rows of progressive dies and cutters, said strip having a central, longitudinal lug-forming portion and two expandable grid-forming

portions flanking the lug-forming portion and extending to both longitudinal edges of the strip, and said rows comprising a plurality of dies and cutters which converge in incremental steps on the central lug-forming portion of the strip passing between them;

periodically shearing bottom-border-forming sections from each longitudinal edge as the strip advances between the first set of dies and cutters, each of said sections being linked to successive sections and to the remainder of said grid-forming portion by unsheared portions of the strip intermediate the sections;

expanding a first part of the remaining grid-forming portions along the longitudinal edges thereof by periodically shearing rectangular wire-like segments from said edges into a plurality of tiers of undulatory skeletal elements extending at acute angles to the plane of said lug-forming portions and such that successive tiers are offset one from the other and joined one to the other by a plurality of nodes which join the ends of successive segments in one tier to the centers of like segments in successive tiers;

at approximately midway through the progressive dies, engaging the underside of said border-forming sections and pushing it upwardly to pull on the already expanded part and remove any deleterious curl forming therein;

expanding the remainder of the grid-forming portions in the same manner as done for said first parts;

said nodes for said first parts and remainders having rectangular, vertically transverse cross-sections and widths significantly greater than said predetermined thickness and equal to the sum of the widths of the adjoining skeletal elements, whereby two reticulated portions comprising a plurality of polygonal paste-retaining cells bounded by said skeletal elements and nodes are formed with a continuous row of unexpanded bottom-border-forming sections on the lateral edges thereof and extend at acute angles from the central portion in gull-wing fashion when viewed head-on;

leveling the thusly expanded strip by folding said reticulated portions down into nearly the same plane as said central portion;

uniformly stretching the reticulated portions in directions substantially perpendicular to the direction the strip is fed through the dies by urging each tier of skeletal elements in those directions independently of the other tiers to uniformly size the cells, stretch the reticulated portions to a predetermined width and slightly rotate the rectangular nodes such that diagonally opposing edges of the nodes become salient in the principal planes of the reticulated portions;

flattening the reticulated portions by further rotating said nodes and compressing said salient edges into plateaus and thereby convert the rectangular cross-sections of said nodes to polygonal cross-sections having two opposing sides thereof laying in planes substantially parallel to the faces of the pasted plate and spaced one from the other by a distance greater than said predetermined thickness but substantially less than twice said predetermined thickness;

substantially engulfing the reticulated portions in a leady active material paste and sandwiching same between strips of paper which are substantially coextensive with said reticulated portions;

drying the paper-bound pasted strip; and

finally segmenting the pasted strip into individual battery plates.

3,890,161

DIODE ARRAY

Charles M. Brown, III, 1378 Johnson St., Menlo Park, Calif. 94025

Filed July 16, 1973, Ser. No. 379,588

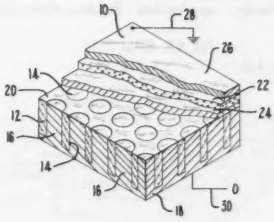
Int. Cl. F42b 1/04

U.S. Cl. 136—212 **7 Claims**

1. A diode array for rectifying thermal electrical noise comprising:

a plurality of diodes connected in parallel having a first common output terminal from which current is withdrawn connectable to a load, and a second common ground terminal connected to ground, wherein said diodes are uniformly oriented to preferentially conduct internally generated current from thermal electrical noise to said first common output terminal,

wherein said plurality of diodes comprises:



a dielectric membrane with first and second surfaces having a plurality of discrete pores through the membrane isolating discrete metal/metal diodes formed by a first metal layer on said first surface of said membrane filling at least in part said discrete pores, a second metal layer on said second surface of said membrane, and a metal oxide layer interfacing said first and second metal layers.

3,890,162

THERMOCOUPLES

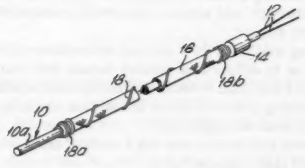
Gordon William Dawson, Colliers End, Near Ware, and Howard Meredith Dixon, Chestnut, both of England, assignors to Sangamo Weston Limited, Enfield, Middlesex, England

Filed June 6, 1973, Ser. No. 367,415

Claims priority, application United Kingdom, June 27, 1972, 30080/72

Int. Cl. H01v 1/02

U.S. Cl. 136—230 **5 Claims**



1. A thermocouple comprising a tubular protective sheath, an elongate sensing element positioned coaxially within said sheath with a thermojunction at one end of the element within the sheath, and support means between the sensing element and the sheath, said support means having uninterrupted contact both with the sheath and with the sensing element over a substantial part of the length of the sensing element, being yieldable radially of the sensing element to provide a resilient cushioning effect along the supported length of the sensing element, and permitting relative axial movement between the sensing element and the sheath in response to differ-

ential thermal expansion of the sensing element and the sheath.

3,890,163

ULTRA HIGH FREQUENCY TRANSISTORS MANUFACTURING PROCESS

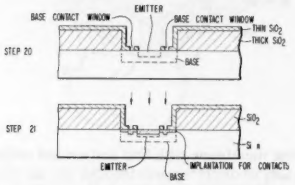
Bernard R. Pruniaux, Nice, and Jean-Louis Assemat, Paris Cedex 16, both of France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris, France

Filed Oct. 31, 1973, Ser. No. 411,281

Claims priority, application France, Nov. 10, 1972, 72.39949

Int. Cl. H01l 7/54

U.S. Cl. 148—1.5 9 Claims



1. Process for manufacturing a planar UHF transistor with the emitter region enclosed within the base region starting from a semiconducting body of regular lattice organization coated with an epitaxial layer of low first type of conductivity, part of which constitutes the collector region, comprising the following steps:

oxidizing said epitaxial layer up to several tenths of micrometer thick in humid atmosphere to form a thick oxide layer;

photoetching a first window in said oxide layer according to a base pattern;

diffusing a first impurity of a second type of conductivity through said first window;

oxidizing a second time said epitaxial layer including said first window up to about 0.1 μm thick in humid atmosphere to form a thin oxide layer;

photoetching a second window for the emitter in said thin oxide layer within said first window;

ion implanting a second impurity of said first conductivity type through said second window so as to predeposit the emitter dopant;

annealing said body in a neutral atmosphere below 1,000° C, so as to diffuse said emitter dopant and rearrange the lattice which had been disturbed by said implantation;

photoetching a third window in said thin oxide layer outlining the base contacts; and

metallizing said second and third window areas on the upper face of said epitaxial layer.

3,890,164

SURFACE TREATMENT OF TINPLATE FOR IMPROVING SULFUR RESISTANCE

Shunichi Harada, and Takahisa Yoshihara, Chiba, both of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed July 9, 1973, Ser. No. 377,397

Int. Cl.[2] C23F 7/26

U.S. Cl. 148—6.2 5 Claims

4. Surface treatment of tin-plated steel according to claim 1 further comprising applying an aqueous acid solution containing 6-valent chromium ions after the heating step.

3,890,165

PASSIVATION OF MATERIALS WHICH COME INTO CONTACT WITH PEROXYGEN COMPOUNDS

Hsiang Peng Liao, Glen Burnie, Md., assignor to FMC Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 27,147, April 9, 1970, abandoned. This application Aug. 9, 1972, Ser. No. 279,071

Int. Cl. C23f 9/00

U.S. Cl. 148—6.15 R 4 Claims

1. A method of passivating a stainless steel, aluminum or aluminum alloy surface that is to come into contact with a peroxygen compound, comprising contacting the surface with a liquid treating agent, said liquid treating agent being a solution consisting essentially of a solvent containing 0.5 to 10% by weight of a member of the group consisting of $Na_5(2\text{-ethylhexyl})_5(P_3O_{10})_2$ and $Na_5(\text{capryl})_5(P_3O_{10})_2$, at a temperature of 50° to 100°C. for at least 5 minutes.

3,890,166

ACTIVATION OF PARTICULATE ALUMINUM

Thomas J. Kondis, Pittsburgh, Pa., assignor to Aluminum Company of America, Alcoa Center, Pa.

Filed Nov. 17, 1972, Ser. No. 307,334

Int. Cl. C23f 7/00

U.S. Cl. 148—6.27 16 Claims

1. A process for production of a highly reactive pyrophoric aluminum which permits creation and maintenance of nascent aluminum surfaces while inhibiting rewelding together of such surfaces which comprises milling particulate aluminum in the presence of a milling aid capable of sorbing onto the surface of the aluminum sufficiently to prevent welding of the particles and at the same time allow access by a reactive substance to the nascent aluminum surface; said milling aid being selected from the group consisting of: oxygen-containing compounds, olefins, hyrocarbon free radicals, hydrazine free radicals, and chlorinated hydrocarbons.

3,890,167

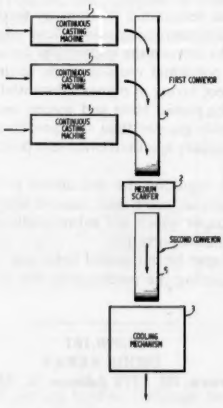
METHOD AND APPARATUS FOR PRODUCING A CASTING HAVING A SATISFACTORY SURFACE WITH A CONTINUOUS CASTING OPERATION

Teruhiko Nozaki, Nishinomiya, Japan, assignor to Kobe Steel, Inc., Kobe, Japan

Filed Sept. 7, 1973, Ser. No. 395,143

Int. Cl. B23k 7/00

U.S. Cl. 148—9.5 6 Claims



1. A method for producing a casting having satisfactory surface properties in the step after a continuous casting operation wherein the casting solidified in a continuous casting

machine is subjected to a scarfing operation while the casting is kept at a high temperature, comprising the steps:

applying a scarfing operation to the casting while the surface temperature of the casting is maintained at 700°–900°C, and

immediately cooling said casting to bring the surface temperature thereof below 400°C.

5. A device for producing a casting having satisfactory surface properties, comprising a continuous casting machine for continuously solidifying molten steel, a medium scarfer for scarfing said casting at 700°–900°C in surface temperature, a cooling mechanism for cooling said casting, a first conveyor for carrying said casting from the continuous casting machine to the medium scarfer, and a second conveyer for carrying said casting from the medium scarfer to the cooling mechanism.

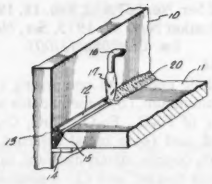
3,890,168
EXOTHERMIC WELDING COMPOSITION

Harold A. Shumway, 25529 Via Brava, Valencia, Calif. 91355

Continuation-in-part of Ser. No. 74,092, Sept. 21, 1970, abandoned. This application Nov. 29, 1972, Ser. No. 310,330

Int. Cl. B23k *35/34*, *23/00*

U.S. Cl. 148—24 9 Claims



1. A stoichiometrically balanced; homogeneously admixed exothermic welding composition comprising the ingredients: from about 65 to 85 weight percent of an admixture of powdered elemental aluminum and powdered iron oxide with from about 9 to 15 weight percent of said composition being said powdered elemental aluminum, from about 5 to 20 weight percent of powdered glass-forming slag melting poing depressants selected from the group consisting of calcium, silicon and magnesium materials which during welding yield calcium, silicon and/ or magnesium, and an amount of selected powdered alloying agents effective to form a predetermined alloy, said composition being compressed to between about 60 and 80 percent of its theoretical volume whereby the quantity of entrained air in said composition is mimized.

3,890,169
METHOD OF FORMING STABLE NATIVE OXIDE ON GALLIUM ARSENIDE BASED COMPOUND SEMICONDUCTORS BY COMBINED DRYING AND ANNEALING

Bertram Schwartz, Westfield; Stuart Marshall Spitzer, Berkeley Heights, and Gregory Dyett Weigle, Somerset, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 26, 1973, Ser. No. 344,702

Int. Cl. H01l *7/44*

U.S. Cl. 148—187 4 Claims

1. In a process for fabricating a compound semiconductor device, the method of forming a stable oxide on the surface of a semiconductor portion comprising a material selected from the group consisting of GaAs, GaAlAs and GaPAs, comprising the steps of growing an oxide on the surface of the said semiconductor portion, drying said oxide by heating to a temperature of approximately 150–300°C for approximately ½ hour to 5 hours in a nonoxidizing ambient and subsequently annealing the oxide by heating to a temperature of approximately 450°–700°C for a period of approximately 15 minutes to 12 hours in a nonoxidizing ambient.

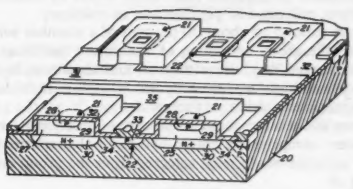
3,890,170
METHOD OF MAKING A MULTICOLOR LIGHT DISPLAY BY GRADED MESAING

Malcolm J. Russ, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Division of Ser. No. 230,293, Feb. 29, 1972, abandoned. This application Nov. 2, 1973, Ser. No. 414,070

Int. Cl.² H01l *7/36*

U.S. Cl. 148—175 3 Claims



1. A process for the manufacture of a multi-color monolithic light display comprising:

providing a substrate of a semiconductor material of a first composition;

epitaxially depositing thereon a semiconductor material layer graded from said first composition to a semiconductor material of a second composition;

continuing the deposition of said second composition material to form a coherent layer on said graded layer;

masking selected portions of said layer of said second composition material;

epitaxially depositing mesas of semiconductor material on the unmasked portions of said layer of the second composition material, which mesas are graded from the said second composition material to a semiconductor material of a third composition;

continuing deposition of said third composition material to form a coherent layer thereof on the surface of said mesas;

masking selected portions of said mesa and said layer of the second composition material; and

diffusing dopants into selected unmasked portions thereof to form PN junctions in the surface of said mesas and in the surface of the layer of the second composition material between said mesas.

3,890,171
EXPLOSIVE COMPOSITIONS CONTAINING GUAR GUM DERIVATIVE

Harvey A. Jessop, Murray, Utah, assignor to Ireco Chemicals, Salt Lake City, Utah

Continuation of Ser. No. 197,373, Nov. 10, 1971, abandoned. This application May 14, 1973, Ser. No. 360,153

Int. Cl. C06b *1/04*, *19/00*

U.S. Cl. 149—19.1 4 Claims

1. A thickened, cross-linkable oxidizer salt-containing explosive composition which is pumpable when initially formulated comprising an aqueous solution of at least one inorganic oxidizer salt; a guar gum derivative having a lower molecular weight than guar gum, contained and hydrated in said solution at time of formulation, in an amount sufficient to provide for strong, stable cross-linking of the composition, said derivative consisting essentially of guar gum which has been reduced to a molecular weight in the range of about 50,000 to about 150,000 prior to its addition to said composition; a cross-linking agent and a fuel.

3,890,172

SOLID PROPELLANT COMPOSITION WITH AZIRIDINE CURED EPICHLOROHYDRIN POLYMER BINDER

Harold E. Filter, Midland; Harvey D. Bidlack, Shepherd, and Don L. Stevens, Sanford, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 29, 1968, Ser. No. 780,945
Int. Cl. C06d *5/06*
U.S. Cl. 149—19.6 **3 Claims**

1. A solid propellant composition comprising on a weight basis:

A. from about 50 to about 75 percent of a member selected from the group consisting of hydrazinium perchlorate, hydrazinium diperchlorate, hydroxyl amine perchlorate, nitronium perchlorate and alkali metal or ammonium nitrate, chlorates or perchlorates as oxidizer;

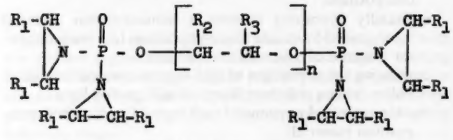
B. from about 5 to about 30 percent of a member selected from the group consisting of aluminum, beryllium, lithium, magnesium, alloys thereof, and aluminum hydride, beryllium hydride, boron hydrides, lithium hydride, and magnesium hydride, as fuel, and

C. from about 10 to about 30 percent of a polymeric binder system comprising a chloro-hydroxy polymer cured with an aziridine-based resin selected from the group consisting of:

a. tris[2-alkyl-1-aziridinyl]phosphine oxide, wherein the alkyl substituent group is methyl or ethyl,

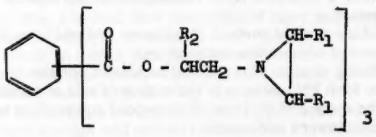
b. tris[1-aziridinyl]phosphine oxide,

c. bis(1-aziridinyl) phosphinate terminated polyglycol oxides having the general formula:



wherein n is an integer ranging from 1 to 5; R_1 is —H, —CH_3, or C_2H_5; R_2 is —CH_3, or C_2H_5; and R_3 is —H, —CH_3, or C_2H_5,

d. tris[2-(alkyl-substituted-1-aziridinyl)-ethyl]benzenetricarboxylates corresponding to the structural formula:



wherein R_1 is —H, —CH_3 or —C_2H_5; and R_2 is —H, —CH_3 or —C_2H_5, and

e. triaziridinyl melamine, and wherein the polymer is a member selected from the group consisting of,

1. polyepichlorohydrin,

2. copolymers of epichlorohydrin and from about 1 to about 70 percent of ethylehe oxide or propylene oxide.

3,890,173

SOLID PROPELLANT CONTAINING ETHYLENE-CARBOXYLIC ACID POLYMERS CURED WITH AZERIDINE-BASED RESINS

Harold E. Filter, Midland, and Harvey D. Bidlack, Shepherd, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 29, 1968, Ser. No. 780,948
Int. Cl. C06d *5/06*
U.S. Cl. 149—19.91 **5 Claims**

1. A solid propellant composition comprising on a weight basis:

a. from about 5 to about 80 percent of a member selected from the group consisting of hydrazinium perchlorate, hydrazinium diperchlorate, hydroxyl amine perchlorate, nitronium perchlorate, and alkali metal or ammonium nitrates, chlorates or perchlorates as oxidizers;

b. from about 5 to about 80 percent of a member selected from the group consisting of aluminum, beryllium, lithium, magnesium, alloys thereof, and aluminum hydride, beryllium hydride, boron hydrides, lithium hydride, magnesium hydride, or mixtures thereof, as fuel, and

c. from about 5 to about 30 percent of a copolymer of ethylene with an α,β-ethylenically unsaturated carboxylic acid cured with an aziridine-based resin as binder, said copolymer having a molecular weight of from 200 to 5,000, and said binder having an aziridine equivalent/carboxyl equivalent ratio of from 0.5 to 2.0.

3,890,174

PYROTECHNIC COMPOSITION

Horace H. Helms, Jr., 1111 Brantford Ave., Silver Spring, Md. 12090, and Alexander G. Rosner, 10655 Weymouth St., Bethesda, Md. 20014

Continuation of Ser. No. 227,632, Feb. 18, 1972, abandoned. This application Nov. 27, 1973, Ser. No. 419,303
Int. Cl. C06b *15/003*
U.S. Cl. 149—44 **9 Claims**

1. A pyrotechnic composite comprising (1) a mixture of powders of (a) aluminum, (b) a metal oxide selected from the group consisting of Fe_2O_3, Fe_3O_4, CuO, Cr_2O_3, Co_3O_4, and mixtures thereof, and (c) a metal selected from the group consisting of iron, copper, silver, niobium, tungsten molybdenum and mixtures thereof and (2) a source of gas selected from the group consisting of (a) gas maintained under a pressure of 1.05–10 atmospheres in a container, said gas expanding and forcing its way from the container when exposed to the heat of the alloying and oxidizing reaction, and (b) a fluorocarbon which is selected from the group consisting of (A) one solid substance, (B) a mixture of solid substances, (C) one liquid substance, (D) a mixture of liquid substances and (E) mixtures thereof provided that any substance that is to be a source of gas must either vaporize to form gas when exposed to the heat of the alloying and oxidizing reaction, decompose to form gas when exposed to the heat of the alloying and oxidizing reaction or form gas by both vaporizing and decomposing when exposed to the heat of the alloying and oxidizing reaction.

9. A pyrotechnic composition comprising a mixture of powders of (1) aluminum, (2) a metal oxide selected from the group consisting of Fe_2O_3, Fe_3O_4, CuO, Cr_2O_3, Co_3O_4, and mixtures thereof, and (3) molybdenum.

3,890,175

NITROCELLULOSE BASE PROPELLANTS

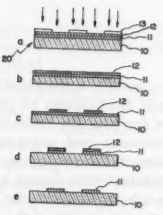
Joseph W. Lavitt, Succasunna, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 4, 1964, Ser. No. 394,633
Int. Cl. C06b *15/02*
U.S. Cl. 149—92 **8 Claims**

1. An improved nitrocellulose base propellant having reduced smoke and moisture vapor content in its products of combustion, said propellant consisting essentially of about 0.5–10% by weight each of a lead salt of a fatty acid and a monoalkali metal salt of a ureide

about 40–60% by weight of nitrocellulose containing about 10–14.2% nitrogen
about 20–35% by weight of a nitrate ester of a polyhydroxy alcohol,
about 5–25% by weight of an acetate ester of a polyhydroxy alcohol, and about 0.5–5.0% by weight of a stabilizer selected from the group consisting of ethyl centralite and 2-nitrodiphenylamine.

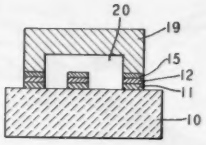
3,890,176
METHOD FOR REMOVING PHOTORESIST FROM SUBSTRATE
Donald A. Bolon, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Continuation of Ser. No. 281,764, Aug. 18, 1972, abandoned. This application Dec. 17, 1973, Ser. No. 425,245
Int. Cl. B44c *1/22*
U.S. Cl. 156—2 **6 Claims**



1. In the method for effecting the complete removal of carbonaceous material from the surface of a substrate involving the steps of,
1. preheating the substrate to a temperature of up to about 260°C, and
2. subjecting the heated substrate to an oxygen atmosphere containing a small percentage of ozone, the improvement which comprises simultaneously subjecting the substrate while in an unheated state to an oxygen atmosphere containing at least ¼ percent by weight of ozone and radiant energy having a wavelength of from 1800A to 3500A and an intensity of at least 100 milliwatts, whereby complete removal of the carbonaceous material from the surface of the substrate is effected in less time and the requirement of preheating the substrate and maintaining it at an effective carbonaceous material removal temperature prior to its exposure to the oxygen atmosphere containing a small percentage of ozone is eliminated.

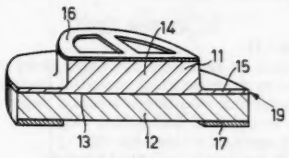
3,890,177
TECHNIQUE FOR THE FABRICATION OF AIR-ISOLATED CROSSOVERS
Arnold Pfahnl, Allentown, and Walter Worobey, Center Valley, both of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Continuation of Ser. No. 175,501, Aug. 27, 1971, abandoned. This application Mar. 8, 1973, Ser. No. 339,175
Int. Cl. H05k *3/06*
U.S. Cl. 156—7 **3 Claims**

1. The method of fabricating, upon an insulating substrate, a pattern of deposited gold circuitry including an air-isolated gold crossover connecting a first and a third conductive area of gold and bridging a second conductive area of gold, without the necessity of multiple steps of metal evaporation, which method comprises plating (1) a gold crossover column upon each of said first and third conductive areas and (2) a gold beam over a copper spacer layer spanning said third conductive area and connecting said columns, and etching out said copper spacer layer leaving an air-isolated gold crossover CHARACTERIZED IN, as a first fabrication step, evaporating on said substrate successive layers of (1), adhesion promoter, (2) a noble metal selected from the group consisting of platinum, palladium, and rhodium which retards interdiffusion between gold and adhesion promoter, and (3) copper, and thereafter etching away those portions of the copper layer



corresponding to the desired pattern of conductive circuitry with a copper etchant, plating a layer of gold upon the copper metal in the areas from which the copper has been etched, and plating a layer of copper constituting the spacer layer over the gold and copper layers in at least the area to be bridged by the crossover beam.

3,890,178
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE HAVING A MULTI-THICKNESS REGION
Jacques Lebailly, Canen, France, assignor to U.S. Philips Corporation, New York, N.Y.
Division of Ser. No. 307,197, Nov. 16, 1972, Pat. No. 3,803,460. This application Jan. 24, 1974, Ser. No. 436,185
Int. Cl. H01l *5/00*
U.S. Cl. 156—8 **5 Claims**

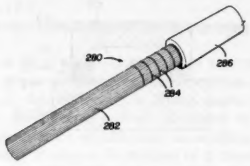


1. A method of manufacturing a semiconductor device comprising at least two regions of opposite conductivity types which are separated by a plane junction and further comprising an annular peripheral zone of relatively high electrical resistance that separates one of the regions from the boundary of the junction, said method comprising the steps of diffusing impurities from at least a part of one of the large faces of the semiconductor crystal to produce said first surface region that has a doping impurity concentration gradient that declines with the depth from said one face removing locally material from at least said first surface region at the diffusion face of said semiconductor crystal, said material being removed over a restricted part of said diffusion face to a depth which is at least two thirds of the distance of said junction from said surface but less than the entire said distance, said restricted part having an annular configuration and comprising a boundary of said junction, the distance between the inner limit of said restricted part and the boundary of said junction being everywhere at least equal to the diffusion depth.

3,890,179
METHOD OF MAKING ELECTRIC CONDUCTOR
Lawrence R. Deardurff, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed June 17, 1974, Ser. No. 480,197
Int. Cl. B44d *1/18;* **H01b** *13/26*
U.S. Cl. 156—53 **4 Claims**

2. In a method of making an electrical conductor wherein a roving comprised of a plurality of glass filaments is coated

with a thermally curable liquid dispersion of conductive particles, the resistance of the conductor being determined by the degree of curing of the coating, the steps of wrapping the coated roving in a plurality of passes about a plurality of spaced curing rolls, tennsioning the roving sufficiently to flatten the roving into a ribbon-like configuration in good



thermal contact with each of the curing rolls, heating the rolls to cure the thermally curable liquid dispersion, spirally wrapping an additional glass element about the ribbon-like roving after curing to obtain a cylindrical conductor, continuously monitoring the electrical resistance of said roving and controlling the degree of curing in response to the monitored resistance.

3,890,180
COATED PAPER

Ludwig Grosse, Taunusstein, and Hans Werner Dorr, Niederwalluf, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Dec. 21, 1973, Ser. No. 427,222
Claims priority, application Germany, Dec. 27, 1972, 2263450
Int. Cl. E04f *13/00*
U.S. Cl. 156—71 **5 Claims**

1. A process for releasably covering a tacky or adhesive layer carried by an article which comprises covering the layer with the coated side of a one-side coated paper formed by application to paper of an aqueous dispersion, free from emulysifying agent, of a copolymer of

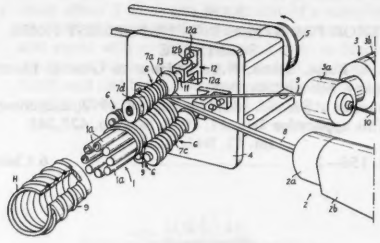
a. 18 to 99 per cent by weight of ethylene,
b. 1 to 7 per cent by weight of an alkali metal salt of a compound of the formula $R_1CH_3C(R_2)CONH—SO_3H$ wherein R_1 and R_2 are hydrogen or a hydrocarbon group containing 1 to 10 carbon atoms, and
c. 0 to 75 per cent by weight of an α,β-unsaturated acid ester containing 4 to 10 carbon atoms, copolymerized at a pressure in the range of 50 to 2,500 atmospheres and at a temperature in the range of 50° to 250° C, in the presence of a free radical initiator.

3,890,181
FLEXIBLE PLASTICS HOSES

Vernon Dennis Stent, and Derek Cecil Wright, both of Woking, England, assignors to Creators Limited, Surrey, England

Filed Apr. 30, 1973, Ser. No. 355,593
Claims priority, application United Kingdom, Nov. 27, 1972, 54636/72
Int. Cl. B31c *3/00*
U.S. Cl. 156—143 **5 Claims**

1. A method of manufacturing a flexible plastics hose of the kind referred to, said method comprising extruding a strip of a first plastics material, simultaneously extruding a reinforcing element of a second plastics material, winding said strip into a helix around a driven mandrel while the plastics material is still in a plastic condition and bonding adjacent turns together by pressure applied between said mandrel and a plurality of annularly grooved roller means circumferentially spaced around and longitudinally along said mandrel and with the annular grooves therein disposed in a helical path corresponding to the pitch angle of said helix to form a tubular wall of said plastics material, and simultaneously winding said reinforcing element while the plastics material thereof is still in a plastic condition around said helix of said first plastics material in spaced helical turns having the same pitch angle as said helix of first plastics material by passing the reinforcing element through the annular grooves of said plurality of roller means to guide the reinforcing element into said spaced helical turns and to press it into the first plastics material by said

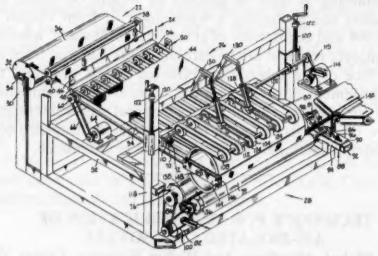


roller means so as to partially embed said reinforcing element into said tubular wall, the plurality of grooved roller means acting like a nut on the partially embedded reinforcing element moving therethrough and engaging the progressively hardening helical turns of the reinforcing element for such a distance along the mandrel as to ensure a total reaction sufficient to advance the tubular wall with the reinforcing element partially embedded therein axially of the mandrel.

3,890,182
METHOD AND APPARATUS FOR APPLYING A COVER TO A CONDUIT

Rupert Douglas Terry, Toledo, Ohio, assignor to Johns-Manville Corporation, Denver, Colo.

Filed Apr. 4, 1973, Ser. No. 347,769
Int. Cl. B65c *3/12, 9/04*; B65h *81/00*
U.S. Cl. 156—187 **10 Claims**



1. Method for applying a cover to a tubular duct comprising:

a. locating a tubular duct on means for supporting the duct which includes a heated roll and a second roll in contact with an outer surface of the duct,
b. effecting rotation of the duct about its longitudinal axis while maintaining the duct in a fixed location by rotating said rolls at the same surface speed,
c. feeding a cover of finite length and having a heat activated adhesive on a major face thereof intermediate the heated roll and the duct to heat the adhesive and bring the major face with the adhesive into contact with the outer surface of the duct,
d. applying pressure to the duct to cause the heated roll to be pressed against the duct by means of pressure applying means which has a surface speed equal to the surface

speeds of said rolls and which engages the outer surfaces of the duct on a portion of the outer surface generally diametrically opposed to the support means,

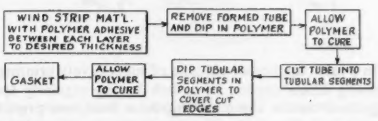
e. rotating the duct until the cover is wrapped about the duct, and

f. effecting movement of the duct away from the support means after the cover has been wrapped about the duct by stopping movement of the pressure applying means while continuing the rotation of said rolls.

3,890,183
METHOD OF MAKING GASKETS AND PRODUCTS FORMED THEREBY

Robert G. Farnam, New Lisbon, Wis., assignor to F. D. Farnam Co., Lyon, Ill.

Continuation-in-part of Ser. No. 840,171, July 9, 1969, Pat. No. 3,697,348. This application May 4, 1972, Ser. No. 250,193
Int. Cl. B65h *81/00*
U.S. Cl. 156—193 **3 Claims**


WIND STRIP MAT'L WITH POLYMER ADHESIVE BETWEEN EACH LAYER TO DESIRED THICKNESS
REMOVE FORMED TUBE AND DIP IN POLYMER
ALLOW POLYMER TO CURE
GASKET
ALLOW POLYMER TO CURE
DIP TUBULAR SEGMENTS IN POLYMER TO COVER CUT EDGES
CUT TUBE INTO TUBULAR SEGMENTS

1. The method of making a convolutely wound gasket characterized by having alternate discrete layers of carrier material and a fluid-impermeable polymer material comprising:

a. taking a web of a carrier material,

b. coating one side of the web with a relatively thin thickness of fluid-impermeable curable polymer material with a typical range of about 0.0001 inch to about 0.0003 inch,

c. drying the coated web to drive off volatiles,

d. coating the other side of the web with a predetermined greater thickness of fluid-impermeable curable polymer material in the range of about 0.0002 inch to about 0.010 inch,

e. drying the dual coated web by driving off the volatiles to provide a dimensionally stabilized, substantially adhesion-free and cohesion-free, coated sheet,

f. heating the coated sheet to soften the coatings,

g. winding the softened coated sheet in convolute fashion with sufficient tension to form a tube with discrete fluid-impermeable barriers of uniform thickness,

h. cutting the tube into individual gaskets, and

i. curing the fluid-impermeable polymer material.

3,890,184
METHOD OF MAKING EXTRUDED RIB BATTERY SEPARATORS

Walter A. Morgan, Daytown, Tex., assignor to Exxon Research and Engineering Company, Linden, N.J.

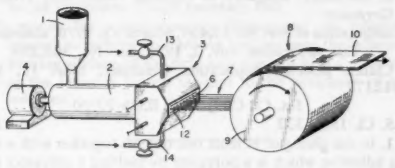
Continuation of Ser. No. 163,206, July 16, 1971, Pat. No. 3,773,590. This application Oct. 12, 1973, Ser. No. 405,958The portion of the term of this patent subsequent to Nov. 20, 1990, has been disclaimed.
Int. Cl. H01m *3/02*
U.S. Cl. 156—244 **4 Claims**

1. A method for forming a ribbed battery separator from a gas laid nonwoven mat of polyolefin fibers having an average diameter of less than 10 microns which comprises:

passing said gas laid nonwoven mat of polyolefin fibers having an average diameter of less than 10 microns through a fixed gap between compacting calender rolls and compacting said mat to a maximum pore size of less than 40 microns,

thereafter passing said mat over a backup plate having a portion that follows an arc, and

extruding a foamed molten thermoplastic polymer through a multihole die onto said mat to form ribs on said mat as

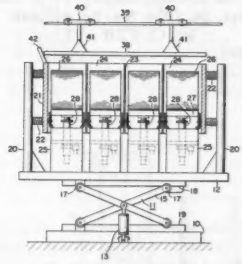


it follows said arc to compensate for shrinkage in the foamed polymer as it solidifies.

3,890,185
METHOD AND APPARATUS FOR MANUFACTURE OF DECORATIVE SHEETS

Kousuke Umazume, 13-5, 2-chome, Shimorenjuku, Mitaka-shi, Tokyo-to, Japan

Filed Jan. 10, 1974, Ser. No. 432,332
Claims priority, application Japan, July 14, 1973, 48-82696
Int. Cl. B32b *31/04*; **B65g** *59/02*; **B65h** *7/00*
U.S. Cl. 156—299 **5 Claims**



1. A method of manufacturing decorative sheets each comprising a relatively rigid backing sheet and a plurality of veneers bonded to one face of the backing sheets, said method comprising consecutively repeated operational cycles each comprising the steps of:

supporting the backing sheet horizontally at a predetermined height above the floor level, said backing sheet being coated with a layer of adhesive on its lower face;

elevating a frame from below said backing sheet into contact therewith, the interior of said frame being partitioned into a plurality of repositories adapted to accommodate stacks of the veneers respectively;

elevating said stacks of veneers relative to said frame until the uppermost veneers of the respective stacks contact the lower face of said backing sheet over the layer of adhesive coating thereon;

lowering the remaining stacks of veneers relative to said frame away from said backing sheet having said uppermost veneers adhering to its lower face; and

lowering said frame away from said backing sheet together with said remaining stacks of veneers accommodated in said repositories thereof.

3,890,186
METHOD OF BONDING USING A POLYESTER HOT-MELT ADHESIVE

Franz Blaschke, Witten-Annen; Arno Gardziella, Witten-Ruedinghausen, and Gerhard Schade, Witten-Bommern, all of Germany, assignors to Dynamit Nobel AG, Troisdorf, Germany

Continuation of Ser. No. 24,439, March 12, 1970, abandoned. This application Nov. 2, 1972, Ser. No. 303,289

Claims priority, application Germany, Mar. 11, 1969, 1912177

Int. Cl. C09j *5/00;* **B32b** *27/20*

U.S. Cl. 156—332 **8 Claims**

1. In the gluing of at least two objects together with a melting adhesive which is a polyester by melting a polyester polymer adhesive, juxtaposing such melted adhesive to at least two solid materials to be glued together and holding said juxtaposition until said melted adhesive has solidified and bonded said solid materials together; the improvement which comprises using as the polyester a material having a melting point of 180° to 220°C having an acid moiety comprising terephthalic acid and a glycol moiety comprising at least one glycol having 2 to 10 carbon atoms, and which improvement furthermore comprises admixing said melted polyester with about 0.01 to 0.1 weight percent of at least one non-coloring, inert, inorganic powder having a grain size of less than 5 microns.

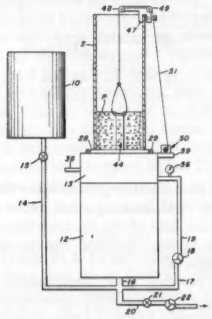
3,890,187
APPARATUS FOR FORMING AN INTERNAL TAPER IN THE WALLS OF A SLEEVE-LIKE BODY

Richard C. Glenn, Hempfield Twp., Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 339,484, March 8, 1973. This application Apr. 24, 1974, Ser. No. 463,480

Int. Cl. C23f *1/02*

U.S. Cl. 156—345 **8 Claims**



1. An apparatus for forming an internal taper in the walls of a sleeve-like body, said apparatus comprising means for mounting said body in an upright position, means for introducing an etching solution to said body to form a pool therein, overflow means for discharging the etching solution from said pool, and means connected with said overflow means for moving it vertically, whereby each successive level of the walls upwardly from the bottom is exposed to solution for a shorter time.

3,890,188
LABEL DISPENSING AND APPLYING APPARATUS

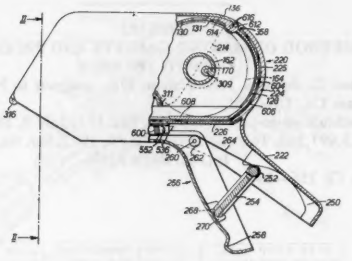
Bernard Sams, 22 Avondale Ave., No. 12, London, England

Filed Aug. 23, 1972, Ser. No. 283,212

Claims priority, application United Kingdom, Aug. 25, 1971, 39850/71; Jan. 29, 1972, 4305/72

Int. Cl. B65h *5/28*

U.S. Cl. 156—384 **22 Claims**



1. In a label applicator capable of successively printing and dispensing labels carried by a web having regularly spaced engagement means along its length, at least one print head assembly including a plurality of selectively adjustable print facets, means pivotally mounting the print head assembly, means operable to detach a printed label from the web, means operative to pivot the print head assembly to bring the operative print facets thereof into tangential contact with a label on the web while the label is moving at the same linear speed as the instantaneous linear speed of the operative print facets, and means operable to advance the web through the applicator to the detaching means including an elongated slidable member having regularly spaced means for engaging positively a plurality of the engagement means of the web, and further regularly spaced means operable to engage positively a plurality of the engagement means of the web, said further regularly spaced means being fixed relative to the applicator as a whole and serving, in cooperation with the first-mentioned engaging means, to advance a printed said label to and beyond the detaching means at an end portion of a given operational cycle, said means operative to pivot said print head assembly and said means operable to advance the web through the applicator being effective to print a given label and deliver it to the detaching means in the same operational cycle of the applicator.

3,890,189
APPARATUS FOR WELDING SYNTHETIC YARNS

Erich Tessmann, and Hans-Erich Tessman, both of Wuppertal, Germany, assignors to Heberlein & Co. AG., Wattwil, Switzerland

Filed Sept. 14, 1973, Ser. No. 397,301

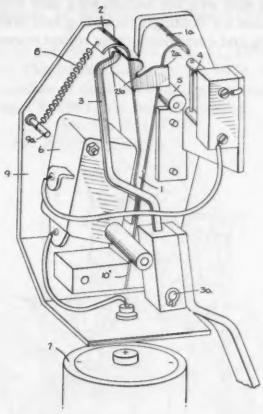
Claims priority, application Germany, Sept. 14, 1972, 2245122

Int. Cl. B65h *69/06, 69/08*

U.S. Cl. 156—433 **6 Claims**

1. Apparatus for welding synthetic yarns comprising a gripper element (*2a*) including means (*2b*) forming a yarn receiving recess, a counter-holder element (*1a*) for securing parallel yarn ends in said recess, and heating means for melting off the yarn ends while simultaneously welding the faces produced thereby, said counter-holder and gripper elements each being arranged on respective levers (**1, 2**), means mounting one of said levers for pivotal movement, means mounting the other of said levers for pivotal movement relative to said one of said levers, said elements each having a flat section for pinching the yarn ends therebetween, actuating means including an arm operable first to press one of said levers towards the other to

bring said yarn receiving recess and said counter-holder element together and then to pivot both elements towards said



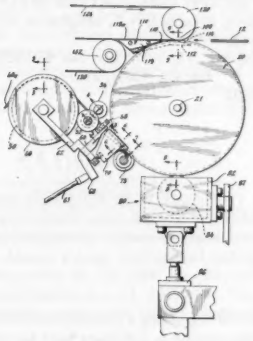
heating means, and means biasing said elements away from said heating means and from each other.

3,890,190

APPARATUS FOR FORMING AND APPLYING TIN-TIE FASTENERS

William H. Eburn, Jr., Appleton, Wis., assignor to Automation & Product Development Corporation, Norwalk, Conn.

Filed Jan. 14, 1974, Ser. No. 432,884
Int. Cl. B65b *61/18*
U.S. Cl. 156—521 **11 Claims**



4. Apparatus for attaching tin-tie strips to a succession of containers comprising, in combination

A. a rotatable support member having a closed continuous periphery and an annular groove formed in and coextensive with that periphery;

B. means for rotating the support member;

C. means for arcuately bending the transverse section of a tin-tie strip wider than said groove and for feeding the bent strip lengthwise into said groove for temporary retention therein with its convex arcuate surface outwardly directed;

D. applicator means mounted adjacent the periphery of said member for applying an adhesive to the outwardly directed surface of a strip retained in said groove during rotation of the member relative to said applicator means;

E. means for advancing a container along a path tangent to the periphery of said member; and

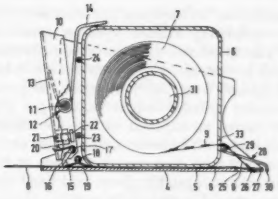
F. means for simultaneously disengaging an adhesive-bearing strip from said groove and pressing the adhesive-bearing surface of the strip into contact with a container as the latter is moved tangent to the periphery of said member.

3,890,191

APPARATUS FOR DETACHING PLATELETS WHICH ARE ADHERING TO A STRIP

Helmut Mayer, 7750 Constance, Germany, assignor to Gerbrueder Mayer, Constance, Germany

Filed Nov. 20, 1973, Ser. No. 417,556
Claims priority, application Germany, Nov. 22, 1972, 2257293
Int. Cl. B65c *9/18, 11/00*
U.S. Cl. 156—541 **11 Claims**

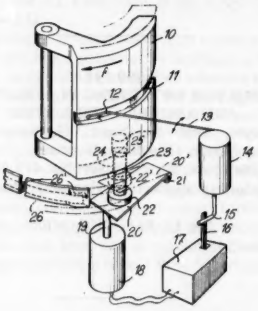


4. Apparatus for detaching platelets which are adhering to a strip or ribbon, for the purpose of transferring the platelets to another support, more particularly for the production of originals for printed circuits, comprising a holder for the ribbon wound to form a ribbon coil and a deflecting edge on the holder, over which the ribbon withdrawn from the ribbon spool is guided and as a result is deflected through about 180°, the platelets being arranged on that side of the ribbon which is directed away from the deflecting edge and are largely detached from the ribbon in passing over the deflecting edge, because of their inherent rigidity, characterized by a transport mechanism to be manually actuated on the holder which comprises a driver element which, with the actuation of the transport mechanism, presses a part of the ribbon already drawn off the ribbon spool against a slide surface on the holder and so displaces it on the said surface that another section of the ribbon is drawn off the ribbon spool, and further characterized in that the transport mechanism is formed by a transport lever which is pivotable on the holder about a pivot shaft at a mid part of the lever to provide an upper lever arm for manual actuation and a lower lever arm mounting the driver element, the ribbon spool being arranged in a box-shaped housing, which is provided with a passage slot for the ribbon which is drawn off, characterized in that a coiled torsion spring extends around the pivot shaft of the transport lever and of which a projecting end bears against the end of the transport lever, while its other projecting end bears on the ribbon spool housing and holds the latter in the holder.

3,890,192
BOTTLE LABELLING MACHINE

Romuald René Della Vite, Nogent sur Marne, France, assignor to Societe Francaise d'Etiquetage Virey & Garnier, Nogent sur Marne, France

Filed Mar. 23, 1970, Ser. No. 21,707
Claims priority, application France, Nov. 19, 1969, 69.39800
Int. Cl. B65c 9/20
U.S. Cl. 156—571 9 Claims



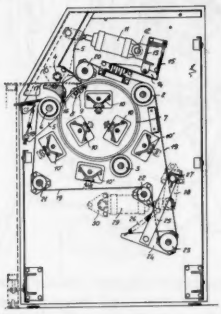
1. In an installation for applying gummed labels to bottles and the like; comprising transfer cylinder means rotatable about a fixed axis to receive successive gum-free labels at a first station and to successively deliver received labels to a second station spaced from the first station for gumming the labels, said transfer cylinder means including a plurality of segments each having an exposed surface for transporting a label in contact therewith between said stations and for holding labels in contact with gum-applying means at the second station, support means rotatable about said fixed axis including means to mount said segments for rotation about said axis and for individual pivotal movement between a normal position at said second station to apply gum to a label and a radially inwardly retracted position at said second station spaced away from the gum-applying means, and sensing means including camming means, said camming means including a member mounted on a segment and a member positioned at said second station, one of said members being movable with respect to the other member when the segment approaches the second station between a first position for non-engagement with said other member when the segment is at the second station to allow the segment to assume said normal position and a second position for the movable member to engage with said other member in response to the absence of a label on the segment after the segment has moved from the first station to positively move that segment to the retracted position before said exposed surface reaches the second station, the exposed surface of each of said segments being provided with a recessed portion, said recessed portion being covered when a label is positioned on the surface, said sensing means including a movable feeler element normally biased to enter said recessed portion at a location between the first and second stations.

3,890,193
MACHINE FOR CONTINUOUS COUPLING OF FABRICS

Giovanni Cartabbia, Via Predore 10, 24067 Sarnico (Bergamo), Italy

Filed Jan. 18, 1974, Ser. No. 434,579
Claims priority, application Italy, Apr. 13, 1973, 22984/73
Int. Cl. B32h 31/00
U.S. Cl. 156—582 9 Claims

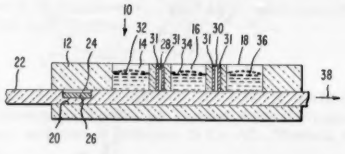
1. A machine for continuous adhesively connecting fabrics, comprising a drum having cylindrical outer and inner surfaces; an endless web extending in tensioned condition about a major portion of said outer surface of said drum; means for introducing the fabrics to be connected between said outer surface and said web for withdrawing said fabrics from said surface; means for floatingly mounting said drum for rotation about its axis and comprising three rollers respectively engaging the surface of said web facing away from said outer drum surface and arranged at the corners of an imaginary triangle; a stationary support, two of said rollers are mounted on said support for rotation about fixed axes parallel to the axis of said drum; means for pressing the third roller towards said outer drum surface; and a plurality of heating means respectively arranged in the interior and externally of said drum.



3,890,194
METHOD FOR DEPOSITING ON A SUBSTRATE A PLURALITY OF EPITAXIAL LAYERS IN SUCCESSION

Michael Ettenberg, Freehold, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 11, 1974, Ser. No. 459,951
Int. Cl.² H01L 29/14
U.S. Cl. 156—622 2 Claims



1. In a method of depositing a plurality of epitaxial layers on a substrate in successsion in a furnace boat having a plurality of wells each of which contains a solution of the material to be deposited in a solvent and a slide extending across the bottoms of the wells and carrying the substrate wherein the slide is moved to carry the substrate into each well and beneath the solution in each well in succession and while the substrate is in each well, the solution in the well is cooled to deposit a layer of the material from the solution onto the substrate, the improvement comprising

while the substrate is being carried from one well to the next well, moving the substrate across an opening in the furnace boat to draw off of the substrate into the opening any solution which may have been drawn along with the substrate from the one well and thereby prevent contamination of the solution in the next well.

3,890,195

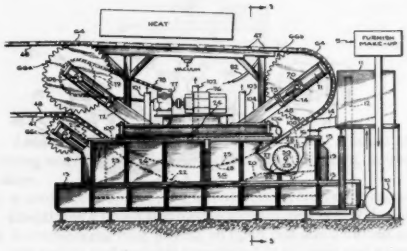
APPARATUS FOR MAKING MOLDED PULP PRODUCTS, INCLUDING MOLDS SECURED TO A MOVING BELT

Charles A. Lee, and Warren R. Furbeck, both of Knoxville, Tenn., assignors to International Paper Company, New York, N.Y.

Continuation of Ser. No. 114,514, Feb. 11, 1971, Pat. No. 3,802,963. This application Mar. 14, 1974, Ser. No. 451,053The portion of the term of this patent subsequent to Apr. 9, 1991, has been disclaimed.

Int. Cl. D21j 7/00

U.S. Cl. 162—387 8 Claims



8. In an apparatus for the manufacture of molded fibrous products which includes means defining a channel for receiving a quantity of furnish, suction box means having a bottom surface defining a stationary boundary surface of said channel, flexible belt means movable through said channel in sliding contact with said boundary surface, and liquid pervious mold means secured to said belt means for travel through said channel, the improvement wherein said flexible belt is supported to substantially define an arcuate catenary within said channel, and wherein said bottom surface of said suction box means has an arcuate configuration conforming substantially to the catenary of said belt means within said channel.

3,890,196

NUCLEAR REACTOR FUEL ELEMENT ASSEMBLY SPACER GRID AND METHOD OF MAKING

John Chetter, Lytham-St.-Annes, England, assignor to United Kingdom Atomic Energy Authority, London, England

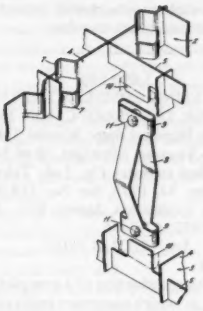
Continuation of Ser. No. 267,629, June 29, 1972, abandoned. This application Oct. 11, 1973, Ser. No. 405,277

Claims priority, application United Kingdom, July 7, 1971, 32006/71

Int. Cl. G21c 3/34

U.S. Cl. 176—78 6 Claims

1. A spacer grid for a nuclear reactor fuel assembly of the kind including a plurality of elongate fuel pins supported in a bundle with their axes parallel, said spacer grid comprising two spaced apart grid tiers each tier including a plurality of intersecting strip members defining a number of openings, the openings in one tier being coincident with those in the other tier, projections extending from mutually adjacent faces of the tiers to project into the space between the tiers, resilient members having ferrule shaped ends engaging said projections and resilient portions between said ends protruding into the space between said grid tiers so as to resiliently engage fuel pins penetrating coincident openings, the ferrules being constructed and arranged so as to be engageable with said projections after individual assembly of the grid tiers, said intersecting strip members being heat bonded to one another for assembly of the grid tiers.



3,890,197

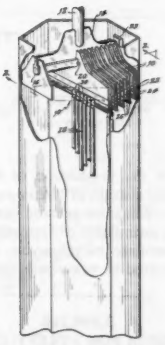
SUSPENSION SCHEME FOR FUEL PIN

Charles E. Butts, Newington, and Harry C. Gray, Manchester, both of Conn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 29, 1961, Ser. No. 113,566

Int. Cl. G21c 3/32

U.S. Cl. 176—78 3 Claims



1. A nuclear fuel pin suspension arrangement comprising, in combination, a rod; a first beam member connected to said rod at one end thereof; a plurality of parallel-spaced slidable fuel support plates attached to said first beam member, the longitudinal axis of said first beam member being perpendicular to the longitudinal axis of each of said fuel support plates, a first coupling means disposed along the length of the first beam member for permitting said slidable fuel support plates parallel movement with respect to the longitudinal axis of said first beam member, a second coupling means located at one end of each of said slidable fuel plates for slidably engaging said first coupling means of said first beam member, a second beam member connected to the other end of each of said parallel-spaced slidable fuel support plates and providing an extension thereof, said second beam member being provided

with a third coupling means disposed along the length of said second beam member at one end thereof; and a plurality of fuel pins provided with a fourth coupling means located at one end of each of said fuel pins for slidably engaging said third coupling means of said second beam member to permit each of said fuel pins parallel movement with respect to the longitudinal axis of said second beam member.

3,890,198

CELL WALL-LYSING COMPLEX ENZYMES AND A PROCESS FOR THE PRODUCTION THEREOF

Reisuke Kobayashi; Hironari Sato; Kiyoshi Takita, all of Shimizu, and Nobuo Toyama, Miyazaki, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

Filed Dec. 14, 1972, Ser. No. 314,933

Claims priority, application Japan, Dec. 14, 1971, 46-100700; Jan. 27, 1972, 47-9486

Int. Cl. C12d *13/10*

U.S. Cl. 195—66 R **5 Claims**

1. A process for the production of a complex enzyme capable of lysing cell walls, which comprises cultivating *Pellicularia sasakii* ATCC 20365 in a culture medium containing assimilable carbon sources and assimilable nitrogen sources to produce and accumulate the complex enzyme in the medium, and then isolating the complex enzyme from the medium.

3,890,199

PROCESS FOR THE PRODUCTION OF BICYCLOMYCIN

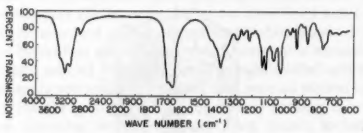
Sadao Miyamura; Nagahiro Ogasawara, both of Niigata, and Hitoshi Otsuka, Kurosaki, all of Japan, assignors to Japan Antibiotics Research Association, Tokyo, Japan

Filed Aug. 8, 1973, Ser. No. 386,852

Claims priority, application Japan, Aug. 8, 1972, 47-79806

Int. Cl. C12d *9/00*

U.S. Cl. 195—80 R **4 Claims**



1. A process for the production of bicyclomycin which comprises cultivating a strain of *Streptomyces aizunensis* identified as ATCC 21,965 under aerobic conditions in a culture medium containing assimilable carbon and nitrogen sources to produce and accumulate bicyclomycin in the culture, and recovering accumulated bicyclomycin from the culture.

3,890,200

SELECTIVE MEDIUM FOR STREPTOCOCCUS MUTANS

Harold V. Jordan, Wellesley, and Johannes Van Houte, Concord, both of Mass., assignors to Forsyth Dental Infirmary for Children, Boston, Mass.

Filed June 14, 1973, Ser. No. 369,803

Int. Cl. C12k *1/06*

U.S. Cl. 195—103.5 R **20 Claims**

1. A selective medium composition for the growth of *Streptococcus mutans*, which composition comprises in combination:

a. a solid medium selective to induce the growth of the *Streptococcus mutans;*

b. the solid medium containing therein a combination of a

i. mono or di saccharide compound; and

ii. a polypeptide antibiotic compound comprising bacitracin,

the saccharide and antibiotic compounds present in a concentration insufficient to prevent the growth of *Streptococcus mutans*, but sufficient to prevent the growth in sufficient quantity of interfering microorganisms.

3,890,201

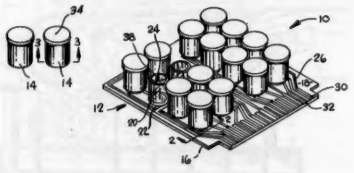
MULTI-CHAMBER IMPEDANCE MEASURING MODULE-CAP COMBINATION

Paxton Cady, Los Altos Hills, Calif., assignor to Bactomatic Inc., Palo Alto, Calif.

Filed Sept. 26, 1974, Ser. No. 509,669

Int. Cl. C12b *1/00*

U.S. Cl. 195—127 **3 Claims**



1. A multi-chamber module-cap combination useful for measuring the impedance of samples of nutrient media in the chambers thereof, some of which samples include aerobic microorganisms therein, comprising, in combination:

a stiff, flat, electrically non-conductive board;

a plurality of identical hollow cylinders open at both ends, each of said cylinders sealed at one end thereof at one side of said board to form a chamber, each cylinder extending to generally the same height from said one side of said board;

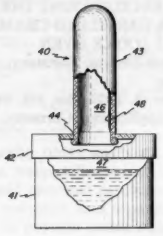
a plurality of electrically conductive strips attached to said one side of said board, said strips providing a pair of spaced-apart contacts under each of said chambers for measuring the impedance from one of said contacts to the other of a sample of a nutrient medium therewithin, said strips further providing accessable portions thereof for connection to impedance-measuring circuitry; and

a plurality of caps made of a resilient material adapted to fit over said cylinders, each cap comprising a generally flat disc-like top, the diameter of said top being greater than the outer diameter of said cylinder, and a skirt proceeding away from said top generally perpendicularly thereto circumferentially thereof, the length of said skirt being greater than the height of said cylinder so that when said cap is fitted over said cylinder said top is prevented from sealing against the other end of said cylinder and said skirt extends against said one side of said board to prevent contamination of said chamber, said skirt including internally thereof a plurality of ribs upraised therefrom generally evenly spaced from one another longitudinally thereof, the internal diameter of said skirt being slightly greater than the external diameter of said cylinder and an internal diameter defined by the tops of said ribs being slightly less than the external diameter of said cylinder, whereby when said cap is in place over said cylinder a press fit results between said ribs and said cylinder and a gas flow channel is provided from the interior of said chamber to the surrounding atmosphere, as defined by the space between said cylinder, said skirt and said ribs and means for preventing the bottom of said skirt from forming a gas-tight seal with said one side of said board.

3,890,202
COMBINED SAMPLING AND BACTERIOLOGICAL CULTURING DEVICE

John A. Bergeron, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 130,254, April 1, 1971, Pat. No. 3,838,013. This application Sept. 27, 1973, Ser. No. 401,424
Int. Cl. C12b 1/02
U.S. Cl. 195—127 2 Claims



1. A device for the dual purposes of sampling a liquid and culturing microorganisms present therein comprising in combination:

a. a container cup defining a first volume for receiving and containing a liquid and having closure means therefor and

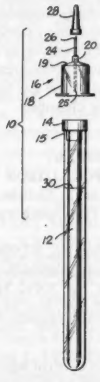
b. a transparent tube having an open end and a closed end removably and sealably connected at its open end to said closure means and projecting outwardly therefrom,

c. at least one layer of sterile solid nutrient material for the growth of microorganisms covering the inside surface area of said tube and defining a second volume, said second volume being in flow communication with said first volume.

3,890,203
METHOD AND APPARATUS FOR THE COLLECTION, CULTIVATION AND IDENTIFICATION OF MICROORGANISMS FROM BODY FLUID

Jack Judson Mehl, Landing, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Continuation-in-part of Ser. No. 215,730, Jan. 6, 1972, abandoned. This application Mar. 16, 1973, Ser. No. 342,086
Int. Cl. C12b 1/00
U.S. Cl. 195—139 15 Claims



1. An apparatus for collection, cultivation and identification of microorganisms contained in a specimen of body fluid, said apparatus comprising:

a container having at least one closed end and an open end;

resilient closure means closing said open end of said container;

a nutrient medium partially filling said container and suitable for culturing microorganisms contained in said specimen;

a gaseous atmosphere filling the space above said nutrient medium; and

a venting assembly mounted on the container and having means for maintaining fluid communication between the outside atmosphere and the atmosphere within the container, said venting assembly comprising a tubular member passing through said resilient closure to provide fluid communication between said gaseous atmosphere above the nutrient medium and the atmosphere outside of said container, said venting assembly including a flexible body portion having a closed end and an open end so that the closure means fitted in the open end of the container is capped thereby;

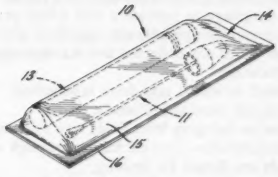
the closed end of the body portion is formed with a hub having an axial bore therethrough and said tubular member is a cannula rigidly mounted in the axial bore between the ends of said bore; and

a shield mounted on the hub to enclose the portion of the cannula extending outwardly from the closed end of the body portion, the shield being formed with a plurality of ribs which are radially disposed around the inner surface thereof so that the shield when mounted on the hub forms a plurality of passageways for the circulation of microbial gases from the interior of the container to the outside atmosphere and for diffusion of atmospheric oxygen from the outside to the inside of the container.

3,890,204
CULTURE COLLECTING PACKAGE

Carl Frederick Avery, Rockford, Ill., assignor to Marion Health and Safety, Inc., Rockford, Ill.

Filed Sept. 26, 1974, Ser. No. 509,706
Int. Cl. C12k 1/10
U.S. Cl. 195—139 5 Claims



1. A culture collecting package, said package including a sealed one-piece ampoule made of glass, said ampoule having an elongated tubular body of circular cross-section and having domed ends, a culture-sustaining media contained within said ampoule, and a circumferentially extending score line formed in said body whereby one end portion of the ampoule may be broken away from the other end portion along said score line to allow access to said media, said package further including a swab comprising an elongated stem, a swabbing tip on one end of said stem, and a closure on the other end of said stem and sized to telescope with and close the open end of said other end portion of said ampoule after a culture has been collected on said tip and the latter has been placed in contact with said media.

3,890,205

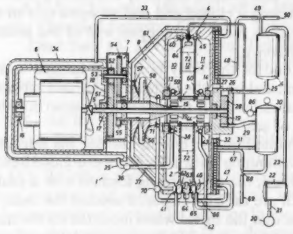
ROTARY DESALINATION ENGINE AND SYSTEM

Emanuel Schnitzer, Houston, Tex., assignor to Frontier Engineering Corporation, Houston and H. B. Zachry Company, San Antonio, both of, Tex., part interest to each

Continuation-in-part of Ser. Nos. 252,202, May 11, 1972, abandoned, and Ser. No. 427,793, Dec. 26, 1973. This application July 17, 1974, Ser. No. 489,363

Int. Cl. B01d *3/08, 3/28*

U.S. Cl. 202—236 **7 Claims**



1. A rotary desalting engine system which comprises:

a rotating drum;

at least one circular disc mounted on and fixed to said rotating drum;

said drum being hollow, permeable, and located centrally in a rotating disc chamber housing wherein each disc divides said housing into at least two chambers, at least one of which is low pressure and one of which is high pressure; said disc being a thin highly thermally conductive plate permitting rapid heat transfer through it between chambers;

channels located in the periphery of the disc chamber in said rotating disc chamber housing in which said discs rotate;

tangential outlets in said rotating disc chamber housing from said channels which maintain the liquid level over the disc periphery to provide a seal which prevents gas passage around the disc between chambers and to remove the liquids which are collected and maintained separated in said channels;

a rotating shaft to which said drum is attached;

motor means for rotating said shaft;

pump means for bringing inlet fluids into said engine;

a tri-fluid counter-flow heat exchanger through which said inlet fluids are passed for heating;

a jacket around said motor through which said inlet fluid passes and is heated by the waste heat from said motor means;

means for spraying the heated inlet fluids against a surface of said discs in the low pressure chamber wherein some of said fluid evaporates and a concentrated liquid is slung from said disc into one of said channels;

compressor means for compressing said vapors formed in the low pressure chamber and which pass through said drum into said compressor means and for introducing the compressed vapors to the high pressure chamber of said rotating disc chamber housing wherein said vapors condense on said rotating disc and are slung from said disc into one of said channels;

passage means for connecting said tangential outlets to said tri-fluid heat exchanger and passing the liquid collected and maintained separated in said channel through said exchanger whereby they are cooled; and,

means for eliminating air or other entrained gases from the system which includes a liquid phase degasser in the inlet fluid line for expanding entrained gases within said inlet fluid and expanding said gases to permit their separation at virtually no expense of energy and a vapor phase degasser which collects vapor bled from the high pressure condensing chamber and condenses the vapor to add to the purified liquid while expelling the evolved gases to the atmosphere.

3,890,206

APPARATUS FOR FACILITATING THE WITHDRAWAL OF GASES FROM A GAS FILLED CHAMBER SUCH AS A COKE OVEN

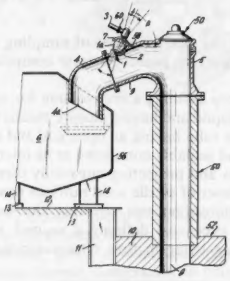
Heinz Wünsch, Herten-Disteln, Germany, assignor to Firma Carl Still, Germany

Filed Mar. 8, 1974, Ser. No. 449,457

Claims priority, application Germany, Mar. 17, 1973, 2313435

Int. Cl. C10b *27/00, 27/04*

U.S. Cl. 202—254 **8 Claims**



1. An apparatus for facilitating the withdrawal of gases from a gas filled chamber such as a coke oven to a gas receiving chamber, comprising a connecting conduit having a riser portion with a lower end connected into the gas chamber and an opposite upper end, a bend portion extending downwardly from the upper end of said riser portion and having the lower discharge end connected to the gas collecting main, and a liquid nozzle universally pivotally mounted in said bend portion having an upper end extending exteriorly of said conduit and an opposite end directed downwardly into said conduit in a selected angular orientation downstream of said riser in order to facilitate withdrawal of the gas through the riser and bend portion to the receiving chamber.

3,890,207

AIR AND WATER POLLUTION CONTROL

Walter H. Chapman, and John F. Eichelmann, Jr., both of El Paso, Tex., assignors to El Paso Southern Company, El Paso, Tex.

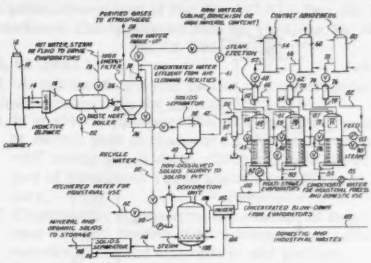
Continuation-in-part of Ser. No. 87,096, Nov. 5, 1970, abandoned, which is a continuation-in-part of Ser. No. 716,222, July 15, 1971, Pat. No. 3,592,743. This application Mar. 20, 1973, Ser. No. 343,178

Int. Cl. B01d *1/26, 1/00, 3/02, 3/00*

U.S. Cl. 203—11 **10 Claims**

3. In a process for pollution control wherein waste gases are purified by contact with water to provide a purified gaseous stream for evacuation to the atmosphere and a water effluent containing dissolving solids and dissolved and absorbed gaseous contaminants, the improvement comprising preventing water and air pollution and recovering usable water by subjecting all of said water effluent to distillation in evaporation apparatus having a preheat zone and a distillation zone to

provide a usable pure water condensate and a solids concentrate, removing gaseous contaminants from said water effluent in a degassing step following said preheat zone and prior to the introduction of the water effluent into the water distillation zone, recovering said removed gaseous contaminants to prevent atmospheric pollution, and separating solids from said solids concentrate to provide usable water.



3,890,208
EXTRACTIVE DISTILLATION WITH FURFUROL AND ACYCLIC KETONE COSOLVENT

Val G. Henneberg, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Filed Aug. 13, 1973, Ser. No. 387,920
Int. Cl. B01d *3/40*
U.S. Cl. 203—58 **10 Claims**

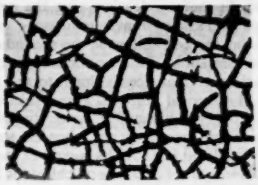
1. In an extractive distillation to separate mixtures of C_4 to C_8 hydrocarbons selected from the group consisting of saturated and ethylenically unsaturated hydrocarbons of like carbon number and different degrees of saturation including the steps of introducing a selective solvent to an extractive distillation column, introducing said hydrocarbon mixtures to be extractively distilled at a point below the point of introduction of said selective solvent, selectively extracting unsaturated hydrocarbon to form a liquid solvent fraction rich in the more unsaturated hydrocarbon, withdrawing a vaporous hydrocarbon fraction as overhead from the top of said extractive distillation column, and withdrawing the solvent rich in the more unsaturated hydrocarbon from the bottom of said distillation column, wherein the improvement comprises employing as said selective solvent 88 to 99 weight percent furfural and from about 1 to 12 weight percent of an acyclic ketone having from selected from the group consisting of 3-methyl-2-hexanone, 4-methyl-2-hexanone, 4-methyl-3-hexanone, 5-methyl-3-hexanone, 2-heptanone, 3-heptanone, 4-heptanone, 3-ethyl-4-methyl-2-pentanone, 3,3-dimethyl-2-hexanone, 3,4-dimethyl-2-hexanone, 2,2-dimethyl-3-hexanone, 2,5-dimethyl-3-hexanone, 4,4-dimethyl-3-hexanone, 2-methyl-4-heptanone, 3-octanone and 4-octanone, said weight percent being based on dry solvent.

3,890,209
ABRASION RESISTANT MECHANICAL MEMBER WITH COMPOSITE NICKEL-PLATING LAYER HAVING MESHLIKE POROUS PORTION AND A METHOD FOR MANUFACTURE THEREOF

Toshihiko Shigeta, Kure; Toshio Yamada, Aki; Takao Sasame, Hiroshima, and Yoshitaka Uebayashi, Aki, all of Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed June 1, 1973, Ser. No. 366,019
Claims priority, application Japan, June 3, 1972, 47-55257
Int. Cl. C23b *7/00, 5/00, 5/08*
U.S. Cl. 204—16 **6 Claims**

1. An abrasion-resistant mechanical member which comprises a composite nickel-electroplated layer on the surface of said member, said layer having a mesh-like porous portion which contains therein ceramic powder as an abrasion resistant element, said porous portion being composed of grooves of approximately 0.01 to 0.5 mm in width and present at



intervals of approximately 0.5 to 9 mm. thereby to provide an oil retention characteristic.

3,890,210
METHOD AND ELECTROLYTE FOR ELECTROPLATING RHODIUM-RHENIUM ALLOYS

Peter Stevens, Parsippany, and George R. Lurie, South Bound Brook, both of N.J., assignors to Oxy Metal Industries Corporation, Detroit, Mich.

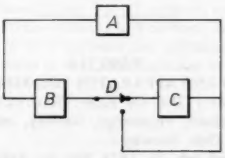
Continuation-in-part of Ser. No. 372,376, June 21, 1973, abandoned. This application Sept. 20, 1974, Ser. No. 507,831
Int. Cl. C23b *5/32*
U.S. Cl. 204—43 N **7 Claims**

1. An aqueous acidic electroplating bath, suitable for depositing a bright rhodium-rhenium alloy consisting essentially of rhodium and rhenium comprising at least 10 g/l of sulfamic acid, from 0.1 to 15 g/l of rhodium as a plateable compound, and at least 0.01 g/l rhenium as a plateable compound in a weight ratio of rhodium to rhenium of at least 4:1.

3,890,211
PROCESS FOR RECOVERING ENERGY FROM THE DECOMPOSITION OF AMALGAM IN THE ELECTROLYSIS OF ALKALI METAL CHLORIDES

Eberhard Zirngiebl, Cologne-Flittard, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 855,772, Sept. 5, 1969, abandoned. This application Apr. 19, 1973, Ser. No. 352,490
Claims priority, application Germany, Sept. 21, 1968, 1792588
Int. Cl. C01d *1/08*
U.S. Cl. 204—99 **1 Claim**



1. The process for recovering energy from the decomposition of the amalgam which results from the electrolysis of alkali metal chlorides which process includes the steps of decomposing by electrolysis alkali metal chlorides in a primary cell having a mercury cathode which primary cell is amalgam-forming, forming sodium amalgam as a by-product of said electrolysis, decomposing the amalgam in a secondary amalgam-decomposition cell connected in series with the primary cell wherein the improvement comprises a direct current source combined with means for connecting an electrical potential from said direct current source across a primary cell and electrolyzing alkali metal chlorides in the primary cell and means for selectively connecting said electrical potential also across a secondary cell containing sodium amal-

gam in an amalgam element of $Pt/H_2,NaOH,H_2O/Na,Hg$ so that the current of said direct current source passes through both the primary cell and in series through the secondary cell when the sodium concentration in the amalgam is more than 0.01% by weight thereby decomposing the amalgam in the secondary cell with said current to reduce the sodium concentration, reducing the cell voltage in the secondary cell having said amalgam element by reducing the sodium concentration, correlating said secondary cell voltage to the selective connecting of said electrical potential across said secondary cell and disconnecting the means for connecting said electrical potential across said secondary cell when the sodium concentration in the amalgam is 0.01% by weight or less and thereby continuing electrolysis of alkali metal chlorides in the primary cell and increasing the concentration of sodium in the amalgam element of the secondary cell to more than 0.01% by weight.

3,890,212

USEFUL PRODUCT DERIVED FROM GRAPEFRUIT PULP

Jakob Harich, and Franz P. Harich, both of Orlando, Fla., assignors to Rush-Hampton, Inc., Orlando, Fla.

Continuation-in-part of Ser. No. 27,080, April 9, 1970, abandoned. This application Mar. 19, 1971, Ser. No. 126,251

Int. Cl. A61k *27/02, 27/14;* **B01j** *1/10*

U.S. Cl. 204—158 R **10 Claims**

1. A process for preparing an organic composition which comprises contacting the pulps of grapefruit with a nontoxic liquid, alkyl polyhydric alcohol or a lower alkyl ether thereof in the presence of ultraviolet light to form a reaction product, and separating this product from the pulp residue.

3,890,213

MERCAPTOALKYLTRIALKOXYSILANE PRODUCTION

Rector P. Louthan, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 28, 1973, Ser. No. 392,234

Int. Cl. B01j *1/10*

U.S. Cl. 204—158 **9 Claims**

1. A process for the preparation of mercaptoalkyltrialkoxysilanes which comprises reacting an ethylenically unsaturated trialkoxysilane with hydrogen sulfide in the presence of ultraviolet radiation.

3,890,214

METHOD AND APPARATUS FOR MECHANIZED SMUTTING OF ELECTROLYZERS

Sigbjorn Kleveland, Voyenenga, Norway, assignor to Norsk Hydro A.S., Oslo, Norway

Filed Feb. 26, 1974, Ser. No. 446,111

Claims priority, application Norway, Mar. 1, 1973, 825/73

Int. Cl. C22d *3/08, 3/02*

U.S. Cl. 204—70 **5 Claims**

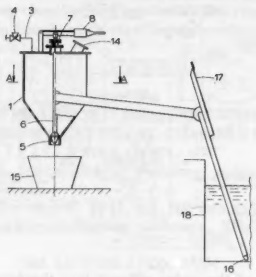
1. In a method for the removal of sludge from electrolyzers, particularly electrolyzers for the fused salt electrolysis of magnesium, wherein a mixture of melted electrolyte and sludge, by means of a suction pipe immersed in an electrolysis bath, is transferred by suction from the bath into a collecting tank which is connected to a vacuum source, the improvement wherein said method comprises:

passing the mixture of sludge and melted electrolyte through the suction pipe into the tank;

separating the sludge by settling from the melt;

neutralizing the vacuum in said tank; and

passing the melt, after the vacuum is neutralized, back into the bath of the electrolytic cell through said suction pipe, while continuously separating the sludge from the mixture and allowing the sludge to freely sink down to the bottom of the tank.



3,890,215

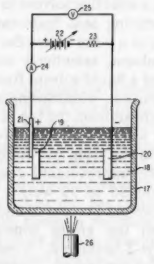
ELECTROCHEMICAL THINNING OF SEMICONDUCTOR DEVICES

James Vincent DiLorenzo, Piscataway; William Charles Niehaus; Daniel Leon Rode, both of Murray Hill, and Bertram Schwartz, Westfield, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 8, 1974, Ser. No. 440,664

Int. Cl. B23p *1/00;* **H01l** *7/00*

U.S. Cl. 204—129.2 **14 Claims**



1. A method for thinning a layer of semiconductor material of one conductivity type with a first impurity concentration in a structure which includes adjacent thereto a semiconductor material of the same conductivity type with a second impurity concentration comprising the steps of:

making the structure the anode in an electrolytic cell wherein the electrolyte is capable of growing an oxide into the surface of the layer upon the application of a potential to said cell;

applying a constant potential to said structure so as to form an electric field distribution in said structure to create a current through said layer sufficient to form an oxide into the surface of said layer;

dissolving the oxide formed by said electrolyte thereby removing a portion of said layer; and

repeating the oxidation and dissolution of the oxide until the current through said layer is insufficient to form said oxide into said layer when said potential is applied as the result of a predetermined electric field distribution being reached uniformly along the major portion of the surface of said layer.

3,890,216
MANUFACTURE OF HYDRAZINE

David Curtis, Bassersdorf, Switzerland, assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 317,011, Dec. 20, 1972, abandoned. This application June 24, 1974, Ser. No. 482,110
Int. Cl. C01b 21/16
U.S. Cl. 204—177 10 Claims

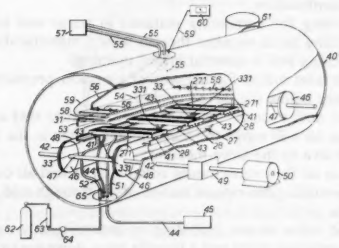
1. A continuous recycle process for the manufacture of hydrazine comprising the steps of;

1. In an electric discharge chamber, subjecting ammonia to an electric glow discharge at a temperature of from about −10° centigrade to about −70° centigrade, under a pressure of from about 100 to about 400 millimeters of mercury;
2. Continuously transporting the product of step (1) to a reservoir and heating it to a temperature sufficient to vaporize unreacted ammonia in said product;
3. Removing liquid hydrazine from said reservoir,
4. Transporting vaporized ammonia to a condenser and condensing the vaporized ammonia of step (2); and
5. recycling the condensed ammonia to step (1).

3,890,217
REACTIVE SPUTTERING APPARATUS AND CATHODE ELEMENTS THEREFOR

Kenneth Burrows, and Robert Hiscutt, both of Birmingham, England, assignors to Triplex Safety Glass Company Limited, London, England

Filed Apr. 11, 1974, Ser. No. 459,988
Claims priority, application United Kingdom, Apr. 27, 1973, 20184/73
Int. Cl. C23c 15/00
U.S. Cl. 204—298 6 Claims



1. Apparatus for depositing a transparent, electrically conducting film of a metallic compound on to the surface of a substrate by reactive sputtering, comprising a vacuum chamber, means for supporting the substrate in the vacuum chamber, a cathode unit including a metal cathode element arranged in the vacuum chamber so as to present towards the substrate a surface substantially parallel to the substrate surface and an electrostatic shield inside said chamber which is spaced from and surrounds the cathode element on all sides except that of the surface presented towards the substrate, means for connecting the cathode element to a source of high negative potential, and means for supplying a sputtering atmosphere of a reactive gas and another gas or gases at reduced pressure through the electrostatic shield into the working space between the cathode element and the substrate, wherein the electrostatic shield is formed with spaced inner and outer walls between which, in use, the sputtering atmosphere is fed into the working space.

3,890,218
UPGRADING ALIPHATIC NAPHTHAS TO HIGHER OCTANE GASOLINE

Roger A. Morrison, West Deptford, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 29, 1974, Ser. No. 456,398
Int. Cl. C10g 35/06
U.S. Cl. 208—135 8 Claims

1. In the process of upgrading the octane number of feed hydrocarbon fractions boiling in the naphtha range having a clear research octane number of less than about 65 to products boiling in the same range having a clear research octane number of at least about 82 by contacting such feed fractions with a catalyst comprising a crystalline aluminosilicate zeolite catalyst having a silica to alumina ratio of at least about 12, a constraint index of about 1 to 12 and a crystal density of not substantially below about 1.6 grams per cubic centimeter at elevated temperatures of about 500° to 1500°F; the improvement, whereby converting more of said feed to said product at an equivalent octane number increase, which comprises utilizing as said catalyst said zeolite having about 0.1 to 10 weight percent of at least one member selected from the group consisting of zinc and cadmium incorporated therewith, said zeolite having a modified activity equivalent to the activity of such zeolite which has had about 0.1 to 3 weight percent of at least one metal moiety selected from the group consisting of sodium, lithium, potassium, phosphorus, antimony and arsenic incorporated therewith.

3,890,219
SELECTIVE ADSORPTION OF HIGH VISCOSITY, LOW VISCOSITY INDEX COMPONENTS FROM HYDROCARBON MIXTURES

Frederic C. McCoy, Beacon, and Raymond C. Schlicht, Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Jan. 2, 1974, Ser. No. 430,134
Int. Cl. C10g 25/00
U.S. Cl. 208—310 22 Claims

1. A process that comprises contacting an initial solution of diluent solvent and a hydrocarbon lubricating oil fraction with a polyurethane foam for a period of time sufficient to effect adsorption of a substantial portion of more viscous, lower viscosity index components of said lubricating oil fraction and recovering an effluent oil therefrom characterized by decreased viscosity and increased viscosity index, said diluent solvent selected from the group consisting of saturated aliphatic hydrocarbon of from 3 to 12 carbons, saturated cycloaliphatic hydrocarbon of from 3 to 8 carbons, aromatic hydrocarbon of from 6 to 9 carbons and mixtures thereof, said solvent being present in said initial solution in a ratio of solvent to oil of from 0.5 to 10:1.

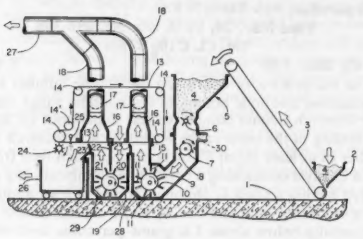
3,890,220
FIBER WASTE RECLAIM SYSTEM AND METHOD

Dean K. Anderson, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 26, 1973, Ser. No. 427,784
Int. Cl. B07b 9/00
U.S. Cl. 209—3 4 Claims

1. The method of separating fibers from a wrapping sheet for the fibers which comprises subjecting pieces of the fiber-sheet composite to a breaking action to break up the wrapping sheet and remove the fibers therefrom, passing an air stream through the pieces of the fiber-sheet composite as they are subjected to the breaking action, and intercepting the air stream containing the fibers and sheet material as the air

stream moves upwardly from the zone of the breaking action by passing across the air stream a foraminous screen having



openings of a size sufficient to permit airborne fibers to pass therethrough and also sufficient to retain other larger pieces.

3,890,221

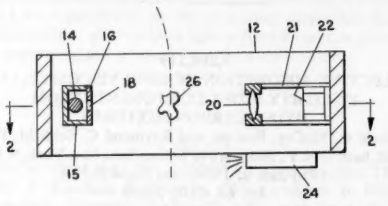
TRANSLUCENCY/OPAQUE SORTING

Urs Muehlethaler, Gerlafingen, Switzerland, assignor to Sortex Company of North America, Inc., Lowell, Mich.

Filed Dec. 14, 1973, Ser. No. 424,729

Int. Cl. B07c *5/342*

U.S. Cl. 209—111.7 **13 Claims**



1. A method of sorting particles according to their degree of transparency comprising the steps of:

passing each particle seriatim through a viewing zone;

illuminating one side of the particles to produce a shadow pattern on a surface in said viewing zone, the shadow pattern of at least some particles having a first area of a first level of light attenuation and a second area of a second level of light attenuation different from said first level, each of said first and second areas being less than the total area of the shadow pattern of said particles,

measuring the relative sizes of the first and second areas of light attenuation; and

sorting those particles which produce a shadow pattern whose ratio of first area to second area exceeds a predetermined value from other particles whose shadow pattern produces a ratio below the predetermined value.

3,890,222

FROTH FLOTATION METHOD FOR RECOVERY OF MINERALS BY MEANS OF ALKALI OR AMMONIUM ALKYL ALKYLARYL, AND ARYL SULFINATES AS FROTH FLOTATION REAGENTS

Vojislav Petrovich, 1925 W. Schiller St., Chicago, Ill. 60622

Filed June 12, 1974, Ser. No. 478,380

Int. Cl.[2] B03D *1/02*

U.S. Cl. 209—166 **7 Claims**

1. A method of beneficiating ores selected from the group consisting of hematite, magnetite sulfide, sulfate, oxide, carbonate, and silicate of zinc; sulfide, carbonate, and silicate of copper; oxide and phosphate of thorium by froth flotation process to produce a froth concentrate of desired metal values leaving gangue minerals in tailings such as silica, alumino and ferromagnesian silicates, calcite, dolomite, siderite, barite, pyrite and pyritic minerals, which comprises effecting the froth flotation of the said ores and minerals in the presence of alkyl, alkylaryl, and aryl sulfinic promoter-collectors, and their alkali metal and ammonium salts as prmoter-collectors, possessing some frothing properties, floating the desired metal values at a pH value of the flotation circuit from 5 to 9; and recovering a froth concentrate relatively rich in the desired metal value leaving a tailings relatively poor in the desired metal value.

3,890,223

JIG FOR THE PREPARATION OF COAL

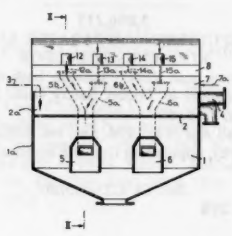
Hans Stern, Dortmund-Hocksten, Germany, assignor to Klockner-Humboldt Deutz AG, Germany

Filed May 1, 1973, Ser. No. 356,083

Claims priority, application Germany, May 6, 1972, 2222321

Int. Cl. B03b *3/26, 3/28*

U.S. Cl. 209—457 **10 Claims**



1. A jig for the preparation of material such as coal comprising in combination:

a housing for containing material in water and having a settling sieve member therein with a material discharge opening and a material intake opening;

an air inlet means for delivery of air under pressure into a space below the sieve member;

an air outlet means for discharging air from said space so that air will move the material and water in the housing relative to the sieve member;

and an air flow valve means connected to said air outlet for controlling the rate of escape of air through said air outlet,

and valve means including an intermittently operating pulsating valve and a throttle valve downstream a sufficient distance from the intermittent valve to permit expansion of gas leaving said pulsating valve.

3,890,224

PROCESS FOR CONTROLLING SURFACE POLLUTANTS

Donald Eric Weiss, Blackburn, and Hendrik Adriaan Jacobus Battaerd, North Clayton, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organisation and Imperial Chemical Industries of Australia and New Zealand Limited, Campbell, Australia

Filed Apr. 29, 1971, Ser. No. 138,679

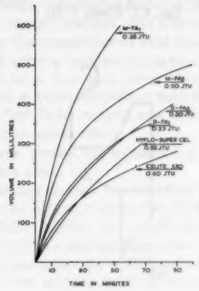
Claims priority, application Australia, May 4, 1970, 1083/70

Int. Cl. C02b *9/02;* **E02b** *15/04*

U.S. Cl. 210—30 **11 Claims**

1. A method of removing an oil slick from aqueous media, said method comprising: firstly, treating said slick with sufficient fine particles or granules of ferromagnetic synthetic polymeric material being characterised in that said ferromagnetic particles preferentially absorb or adsorb oil from aque-

ous media and also the particles or granules float on the aqueous media when associated with the oil; secondly removing



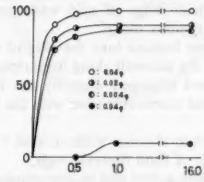
said particles together with the associated oil from the aqueous media by magnetic means.

3,890,225

PROCESS FOR REMOVING HEAVY METAL IONS IN WATER

Yoshiaki Kajiyama, 177 Mukonosou 2-chome, Amagasaki, Japan

Filed June 6, 1973, Ser. No. 367,357
Claims priority, application Japan, June 7, 1972, 47-56658
Int. Cl. C02b *1/44*
U.S. Cl. 210—38 **6 Claims**



1. A process for the removal of heavy metal ions contained in water comprising contacting coral fossil lime stone with said water containing the heavy metal ions.

3,890,226

METHOD OF TREATING ALUMINUM-CONTAINING WASTE WATER

Yuiti Hanami, and Yoji Fukuyama, both of Yokohama, Japan, assignors to Kurita Water Industries Ltd., Osaka, Japan

Filed Mar. 11, 1974, Ser. No. 450,064
Int. Cl. C02b *1/20*
U.S. Cl. 210—44 **9 Claims**

1. A method of treating aluminum-containing waste waters, consisting essentially of

a. an alkaline waste water containing dissolved therein from 40 to 100 g/l of sodium hydroxide and from 10 to 80 g/l of aluminum, and

b. an acidic waste water containing dissolved therein from 100 to 175 g/l of sulfuric acid and from 10 to 20 g/l of aluminum,

comprising the steps of: rapidly adding (b) to (a), with stirring, at a rate such that the pH of the mixed waste waters becomes in the range of from about 12.5 to about 13 and aluminum hydroxide begins to precipitate therein within a time of from about 15 to 40 minutes after the beginning of addition of (b), then continuing to add and stir (b) into the mixed waste waters, at a slower rate such that the pH of the mixed waste waters is reduced to in the range of from about 5.8 to about 8.5 over a period of at least one hour and thereby precipitating beta aluminum hydroxide in substantially needle-like or granular form, the temperature of the mixed waste waters being maintained at 40°C or more during the addition of (b), terminating the addition of (b) when the pH of the mixed waste waters reaches from about 5.8 to about 8.5, and then recovering the precipitated beta aluminum hydroxide containing less than 60 wt. % water from the mixed waste waters.

3,890,227

TREATMENT OF PROCESS WATER

Philip Merchant, Jr., Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Division of Ser. No. 182,866, Sept. 22, 1971, Pat. No. 3,775,312. This application Aug. 29, 1973, Ser. No. 392,718
Int. Cl. C02b *1/20*
U.S. Cl. 210—51 **16 Claims**

1. The process for the separation of salts of the condensation product of naphthalene sulfonic acids and formaldehyde from polymerization process water containing said salts in amount of less than 2 weight percent and containing less than 5 percent total solids which comprises contacting said aqueous composition containing said salt as a first component with a second component which is a polyalkylene amine of the formula $H_2N[-R-NH]_xH$ wherein R is an aliphatic radical of 1 to 5 carbon atoms and x is from 1 to 12 said contacting having been made after at least one of the components has been reduced to a pH of less than 5.0 by the addition of an acid to said component or components and whereby the pH of the combination of the first and second component is also less than 5.0, and separating the resulting precipitate from the aqueous composition.

3,890,228

POLYACRYLATE-POLYPHOSPHONIC ACID TREATMENT IN AQUEOUS SYSTEMS

Chih Ming Hwa, Palatine; Dionisio Guerrero Cuisia, Chicago, both of Ill., and John Allen Gray, Toronto, Canada, assignors to Chemed Corporation, Cincinnati, Ohio

Filed Apr. 13, 1973, Ser. No. 350,875
Int. Cl.[2] C02B *5/06*
U.S. Cl. 210—58 **1 Claim**

1. A method for inhibiting deposits of scale, sludge and other foulants in aqueous systems comprises adding to the said system from 0.1 to 200 parts per million of a 1:1 mixture of sodium polymethacrylate having a molecular weight of 9,000 and hydroxyethylidene diphosphonic acid.

3,890,229

PROCESS AND APPARATUS FOR CLASSIFYING GRANULAR MATERIAL SUSPENDED IN A LIQUID

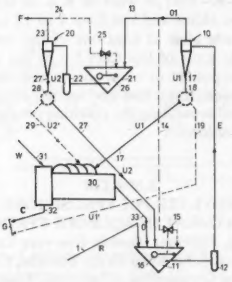
Theodor Eder, Vienna, Austria, assignor to Wagner-Bird Aktiengesellschaft, Austria

Filed Aug. 31, 1973, Ser. No. 393,336
Claims priority, application Austria, Sept. 7, 1972, 7681/72
Int. Cl. B01d *37/04*
U.S. Cl. 210—73 **17 Claims**

1. In a slurry-treating method for obtaining a final fraction in which particles smaller than a given size are suspended in a given concentration, the steps of feeding the slurry which is to be treated initially to a first liquid cyclone having an upper overflow fine fraction discharge and a lower discharge for a substantially dewatered coarse fraction, then feeding the overflow fine fraction discharge from said first liquid cyclone to a second liquid cyclone having an upper overflow discharge for the final fraction and a lower discharge for a substantially dewatered coarse fraction, feeding the substantially dewatered coarse fraction from said first liquid cyclone to a gravity

separator while maintaining at said gravity separator a load which is formed primarily by said coarse fraction from said first liquid cyclone and while supplying fresh liquid to the gravity separator at a rate which controls the concentration of the particles in the final fraction, discharging particles larger than said given size from said gravity separator, and returning from said gravity separtor to said first liquid cyclone a slurry from which particles larger than said given size has been separated.

10. In a slurry-treating apparatus for obtaining a final fraction in which particles less than a given size are suspended in a given concentration, first and second centrifugal separation stages each having at least one liquid cyclone means for providing an upper overflow fine fraction discharge and a lower discharge of a substantially dewatered coarse fraction, the upper overflow discharge of the liquid cyclone means of the second centrifugal stage providing the final fraction, first sump means for containing slurry to be treated, first pump means communicating with said first sump means and with the liquid cyclone means of said first centrifugal separation stage for feeding slurry from said first sump means to said liquid cyclone means of said first stage to be treated therein, second sump means for receiving the upper overflow fine fraction discharge from the liquid cyclone means of said first stage, second pump means communicating with said second sump means and with the liquid cyclone means of said second stage for feeding slurry from said second sump means to said liquid



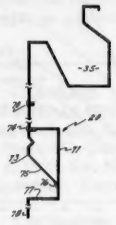
cyclone means of said second stage, gravity separation means and first discharge conduit means communicating therewith and with the lower discharge of said liquid cylone means of said first stage for directing the substantially dewatered coarse fraction discharged from the latter liquid cyclone means to said gravity separation means and for loading said gravity separation means primarily with the coarse fraction from said first stage, liquid supply means communicating with said gravity separation means for supplying liquid thereto at a rate which controls the concentration of the particles in the final fraction, said gravity separation means separating particles larger than a given size from the suspension treated by said gravity separation means, overflow discharge means communicating with said gravity separation means for discharging from the latter and feeding to said first sump means a suspension from which the particles larger than said given size have been separated by said gravity separation means, so that any particles smaller than said given size contained in the coarse fraction of said first stage are returned to the latter by said gravity separation means, and second discharge conduit means communicating with the liquid cyclone means of said second stage for receiving the lower discharge of substantially dewatered coarse fraction therefrom and for delivering at least the greatest part of the latter dewatered coarse fraction also to said first sump means, so that said gravity separation means is not loaded by the greatest part of the coarse fraction of said second stage.

3,890,230

WALL FORMED CONDUIT FOR SWIMMING POOLS AND METHOD OF MAKING THE SAME

James A. Patterson, P.O. Box 44147, Columbus, Ohio 43204

Filed Mar. 14, 1974, Ser. No. 451,064
Int. Cl. E04h *3/20*
U.S. Cl. 210—169 **6 Claims**



1. A swimming pool comprising, in combination:
a recirculating and filter system,
a tank with a floor and metal side and end walls,
metal gutter means constructed and arranged along the upper edge of the metal side and end walls of the pool,
conduit means with a first end connected to said gutter means and a second end in communication with said recirculating and filtering system whereby liquid collected in said gutter is conducted to said filter system,
conduit means comprising metal box structure connected to said walls and constructed and arranged around the periphery of said metal side and end walls of the pool and located on the side of said walls opposite the interior of the tank defined by said walls,
said metal box structure further being located at a height above the bottom edge of said walls and beneath the bottom of said gutter means,
a V-shaped recess formed into the side of said metal box common with the sidewall along its peripheral length and constructed and arranged whereby the interior of said recess is in fluid communication with the interior of said tank,
apertures located in the side walls of said V-shaped recess for the passage of fluid therethrough,
conduit means with a first end in communication with said filter and recirculating system and a second end in communication with the interior of said metal box structure whereby filtered water may be returned to the interior of said tank through said apertures located in the sides of the V-shaped recess.

3,890,231

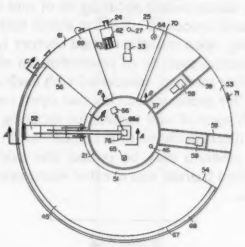
INTEGRAL CIRCULAR WASTEWATER TREATMENT PLANT

Louis Maynard LaClair, Grand Island, N.Y.; John Ruben McWhirter, Westport, Conn., and William Lawrence Ross, Charlestown, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

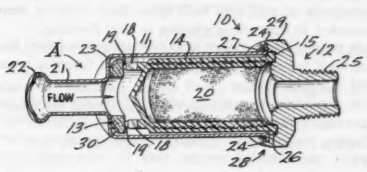
Filed Apr. 2, 1973, Ser. No. 347,398
Int. Cl. C02c *1/06*
U.S. Cl. 210—199 **14 Claims**

1. Wastewater treatment apparatus comprising:
a. A circular tank outer wall;
b. A circular inner wall concentric with and spaced from said outer wall forming an inner volume and intermediate volume between said inner and outer walls, such that the ratio of the inner wall radius (R_1) to the outer wall radius (R_2) is between 0.25 and 0.70;
c. A first radial partition extending across said intermediate volume between and joined at opposite edges to said inner and outer walls;

d. A second radial partition extending across said intermediate volume between and joined at opposite edges to said inner and outer walls, being spaced from said first raidal partition so as to form a first arcuate portion of said intermediate volume bounded by segments of said inner and outer walls comprising between 90° and 330° of their respective circumferences, and a second arcuate portion comprising the remainder of said intermediate volume;
e. First fluid mixing and recirculation means within said outer wall in a first part other than said first arcuate portion and a cover enclosing said first part positioned over said first fluid mixing and recirculation means to form a first aeration zone;
f. First passage means for introducing oxygen gas in said first aeration zone;
g. Second passage means for introducing feed wastewater and thickened activated sludge to said first aeration zone;
h. Second fluid mixing and recirculation means within said outer wall in a second part other than said first arcuate portion and a second cover enclosing said second part positioned over said second fluid mixing and recirculation means to form a second aeration zone;
i. First gas interzone transfer means spaced from first passage means (f) for discharging oxygen-depleted gas from said first aeration zone and introducing same to said second aeration zone as the oxygen-containing gas therefore;
j. First liquor interzone transfer means for discharging first oxygenated liquor from said first aeration zone and introducing same to said second aeration zone for mixing therein with said oxygen-containing gas;
k. Gas vent means spaced from first gas interzone transfer means (i) for discharging oxygen-further depleted gas from said second aeration zone;
l. Liquor passage means for discharging second oxygenated liquor from said second aeration zone;
m. Means for uniformly distributing oxygenated liquor in said first arcuate portion of said intermediate volume around the inner wall segment for radial flow across said first arcuate portion for both clarification of said liquor and thickening of activated sludge therein;
n. Trough means around the outer wall segment upper part of said first arcuate portion for discharging clarified water thereform; and
o. Means for collecting and removing thickened activated sludge from the bottom part of said first arcuate portion and returning at least part of said sludge to said second passage means (g).

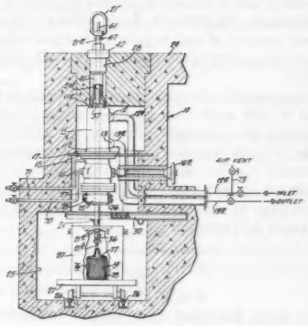


3,890,232
FLUID FILTER
John F. Combest, Findlay, Ohio, and Rupert B. Bell, Detroit, Mich., assignors to R. L. Kuss & Co., Inc., Findlay, Ohio
Filed Mar. 26, 1973, Ser. No. 345,191
Int. Cl. B01d *35/06*
U.S. Cl. 210—223 **1 Claim**



1. A fluid filter comprising an elongate case including a pair of opposed fittings providing fluid openings therethrough, a ring-like magnetic filter adjacent one of said fittings for capturing foreign magnetic particles within the fluid, said magnetic filter including an opening therethrough positioned in the path of the flowing fluid within the case, a filtering mesh adjacent said magnetic filter for capturing remaining foreign particles within the fluid, a conically shaped deflector member between said magnetic filter and said mesh and spaced from said magnetic filtering means for deflecting fluid from an axial path radially outwardly toward said mesh, and axially extending dividers connected to said deflecting means and said mesh, said dividers including resiliently pivotal tabs for compressibly engaging said magnetic filter and providing an unrestricted flow of the fluid from said magnetic filter over said deflector member.

3,890,233
APPARATUS FOR FILTERING RADIOACTIVE FLUIDS
Edwin H. Gischel, 107 Ardwick Ter., Lansdale, Pa. 19446
Filed Apr. 25, 1974, Ser. No. 463,974
Int. Cl. B01d *29/02*
U.S. Cl. 210—237 **19 Claims**



1. Fluid filtration apparatus comprising:
a filter housing having an end wall with an aperture therein and an open end opposite said aperture in said wall,
filtering means adapted to be removably contained inside said housing,
valve means associated with the open end of said housing, said valve means having one operating position closing said open end of said housing and another operating position affording displacement of said filtering means therethrough into and out of said housing,

a valve operator connected to said valve means and operable from a location spaced therefrom to afford actuation of said valve means between said operating positions,

rigid elongated operator means associated with said filtering means and displaceable through said aperture for moving said filtering means into and out of said housing through said valve means, said operator means having a post portion received within said aperture and projecting outwardly of said end wall when said filtering means is mounted in operating relation in said housing,

means releasably engaging said post outside of said housing end wall for removably mounting said filtering means in said housing, and,

means providing a coupling of said filtering means to said operator means releasable at a location remote from said filtering means by movement of said operator means,

whereby the filtering means may be removed from the housing from a location remote from its open end.

3,890,234

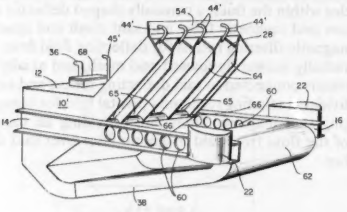
OIL SEPARATION AND RECOVERY DEVICE

Frank Galicia, 5043 Catherine St., Philadelphia, Pa. 19143

Filed Apr. 18, 1973, Ser. No. 352,209

Int. Cl. E02b *15/04*

U.S. Cl. 210—242 **1 Claim**



1. A float-supported device for separating two liquids of different densities forming a liquid interface, including:

float-supported troughs comprising angularly arranged elongated structures presenting a channel substantially inverted and V-shaped in transverse section,

a separation chamber in fluid communication with the lower portion of said angularly arranged elongated structures to receive liquid collected by said elongated structures,

duct means with a first end in communication with a lower end of said separation chamber and a second end constructed and arranged adjacent the inverted V-shaped side of said angularly arranged elongated structures whereby heavier liquid discharged from said separation chamber is discharged in the direction of said elongated structures to induce the flow of liquid to be separated towards said troughs.

3,890,235

VACUUM FILTER

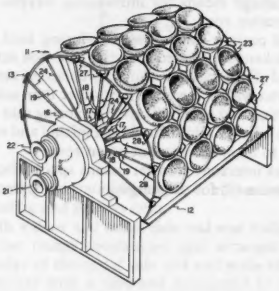
Steven S. Davis, Bountiful, Utah, assignor to Envirotech Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 275,513, July 27, 1972, Pat. No. 3,825,124. This application July 22, 1974, Ser. No. 490,651

Int. Cl. B01d *33/34*

U.S. Cl. 210—330 **2 Claims**

1. A rotary vacuum filter of the type including a tank for holding a slurry to be filtered, a rotary filter element including a plurality of filter sectors and mounted for rotation in said tank whereby said sectors pass successively into and out of submergence in said slurry, a valve and associated conduits for applying vacuum to the interior of each of said sectors during submergence and for supplying pressured fluid to the interior of said sector after emergence; the improvement in which said rotary filter element comprises a substantially cylindrical member having an elongated axial hub and an outer wall formed from a plurality of separate filter sectors each of which comprises a relatively deep concave vessel having an outwardly facing open mouth at one end and a relatively small opening in its wall remote from said open mouth, all of said vessels being spaced radially and concentrically about said hub, a plurality of conduits including a conduit extending between said relatively small opening of each of said vessels



and said valve, clamp means securing all of said vessels in said spaced radial and concentric position about said hub with the outwardly facing open mouths of said sectors lying in a substantially cylindrical surface of revolution an elongated concave flexible filter medium associated with each of said vessels each of said filter mediums having one open end, and means associated with each of said vessels for securing the open end of one of said filter mediums to the open mouth of said vessel whereby said medium may be pulled into said vessel when vacuum is applied thereto and everted when pressured fluid is applied thereto.

3,890,236

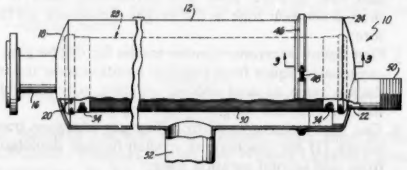
FILTER STRUCTURE

Gary W. Harrell, Bakersfield, Calif., assignor to AG-Water, Inc., Shafter, Calif.

Filed Jan. 14, 1974, Ser. No. 433,083

Int. Cl. B01d *29/14*

U.S. Cl. 210—433 **7 Claims**



1. In a filter structure having a housing provided with an inlet and an outlet and having a filter means located so that liquid flows through said filter structure during the operation of said filter structure the improvement which comprises:

said housing being provided with a closure enabling said housing to be opened and closed, said closure being located opposite said inlet,

a first tubular flange located on said housing so as to extend internally of said housing around said inlet,

a second tubular flange of the same diameter as said first tubular flange located on said closure so as to extend internally of said closure, said second flange being aligned with said first flange,

a self-supporting, foraminous tubular member located so as to extend through said housing, said foraminous member extending around both of said flanges, the exterior of said foraminous member being spaced from the interior of said housing,

a flexible, fabric, tubular filter element located so as to extend along the interior of said foraminous member, said filter element having ends extending around the ends of said foraminous member and back along the exterior of said foraminous member, and

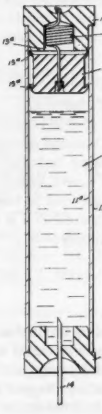
elastomeric resilient sealing rings held under compression between said fabric filter element and each of said flanges, said sealing rings extending completely around said flanges and being constrained against expansion by the said foraminous member,

said outlet being located in said housing exterioly of said first filter element.

3,890,237
PLASMA SEPARATOR — CORD STOP TYPE

Joseph T. Welch, Wanaque, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Feb. 27, 1974, Ser. No. 446,341
Int. Cl. B01d *21/26*
U.S. Cl. 210—516 **2 Claims**



1. A separator assembly, capable of separating blood into its component phases of plasma or serum vs cellular portion, comprising:

a. a container having first and second open ends, and adapted to receive blood for subsequent separation into a light phase and a heavy phase;

b. first and second closures sealing both ends of the container, the first of said closures being formed from a self-sealing elastomeric material which is penetrable by a cannula through which blood to be separated is conducted into the container;

c. a piston having a specific gravity relatively greater than the light phase of the blood and slidably mounted in the container, said piston having means on an outer surface in sealing engagement with an inner surface of the container, said sealing means being constructed and arranged to maintain said piston at a first position adjacent the second of said closures when subjected to a first centrifugal force and to disengage when subjected to a second greater centrifugal force so that when said container is subjected to said first centrifugal force the blood separates into its light phase and heavy phase but the piston stays in said first position and subsequently when said second greater centrifugal force is used the sealing means automatically disengages, the light phase thereby passing around the sealing means enabling the piston to move down through the light phase; and

d. stop means comprising a cord of a predetermined length extending from said second closure to the piston whereby the piston when moving through the light phase will stop a predetermined distance from said first end of the container.

3,890,238
WATER SOLUBILITY OF POLYOXYALKYLENE POLYMERS

Matthew A. Boehmer, Allen Park, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 21, 1972, Ser. No. 317,232
Int. Cl.² C09K *3/00;* **B01F** *1/00;* **C10M** *3/22*
U.S. Cl. 252—1 **5 Claims**

1. The method of raising the critical solution temperature of an aqueous concentrated solution of a liquid polyoxyalkylene polymer surfactant containing a maximum of 20 percent by weight ethylene oxide units the balance of the polymer being made up of polyoxyalkylene units wherein each oxyalkylene unit has three, four or five carbon atoms or mixtures thereof and an initiator selected from the group consisting of ethylene glycol, propylene glycol, fatty alcohols, diamines and water by adding to said solution an alkali metal salt of an organic thiol acid having at least one -SH group, said thiol acid being selected from the group consisting of di lower alkyl dithiocarbamic acid, thioglycolic acid and mercaptobenzothiazole, said thiol acid and said polymer each being present in an amount from 1 to 60 percent with the total of both combined being in an amount of from 10 to 75 percent.

3,890,239
SURFACTANT COMPOSITIONS USEFUL IN OIL RECOVERY PROCESSES

Dale W. Dycus; Earl W. Malmberg, and Harry L. Wilchester, all of Dallas, Tex., assignors to Sun Oil Company, Dallas, Tex.

Division of Ser. No. 328,813, Feb. 1, 1973, Pat. No. 3,827,497. This application May 3, 1974, Ser. No. 466,572
Int. Cl. E21b *43/22*
U.S. Cl. 252—8.55 D **6 Claims**

1. A surfactant composition for use in flooding oil-bearing formations comprising a mixture of

a. 0.5–15 parts by weight of a surfactant salt of an organic sulfonate

b. 0.25–10 parts by weight of a polyalkylene glycol alkyl ether and

c. 0.25–10 parts by weight of a salt of a sulfonated or sulfated oxyalkylated aalcohol

in which the cationic portion of the salts of Components (a) and (c) is selected from the group consisting of alkali metal, amine and ammonium.

4. A surfactant composition for use in flooding oil-bearing formations comprising a mixture of (a) 0.5–15 parts by weight of a surfactant salt of an organic sulfonate and (b) 0.5–15 parts by weight of a salt of a sulfonated oxyalkylated alcohol, each of said salts being selected from the group consisting of alkali metal, amine and ammonium.

3,890,240
TONER COMPOSITIONS AND METHODS FOR THEIR PREPARATION

David L. Hochberg, Bronx, N.Y., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Continuation-in-part of Ser. Nos. 597,240, Nov. 28, 1966, abandoned, and Ser. No. 597,247, Nov. 28, 1966, abandoned. This application May 15, 1970, Ser. No. 38,098
Int. Cl.² G03G *9/04*
U.S. Cl. 252—62.1 **6 Claims**

1. A liquid toner composition for use in electrophotography comprising a dispersion of about 15 parts by weight of finely

divided pigment in a vehicle containing about 30 to 200 parts by weight of a hydrocarbon-soluble acrylic copolymer resin and about 0.01 to 3 parts of a hydrocarbon-soluble polyvalent metal soap both dissolved in a volatile isoparaffinic hydrocarbon the electrical resistivity of which is preadjusted to a value such that the resistivity of the vehicle is between about 1×10^9 and 1×10^{12} ohm-cm. when measured at 25°C., said acrylic copolymer resin being a terpolymer of vinyltoluene, a branched-chain butyl methacrylate and lauryl or stearyl methacrylate, said pigment consisting essentially of finely divided carbon black particles whose diameters are not greater than 25 millimicrons associated with a hydrocarbon-insoluble dye of the group consisting of basic triarylmethane dyes and alizarin dyes, at least some of said carbon black being present in the form of agglomerates of said particles of carbon black, said agglomerates being of a size that will produce high density upon development of an electrostatic image with said composition, and said polyvalent metal soap being a member of the group consisting of the zinc, iron, copper, lead calcium, zirconium and solution-aged rare earth metal and manganese soaps of fatty acids of about 6–18 carbon atoms and mixtures thereof.

3,890,241
PIEZOELECTRIC CERAMIC COMPOSITIONS

Masamitsu Nishida, and Hiromu Ouchi, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Continuation-in-part of Ser. No. 242,250, April 7, 1972, abandoned. This application Sept. 5, 1973, Ser. No. 394,465

Claims priority, application Japan, Apr. 20, 1971, 46-25865The portion of the term of this patent subsequent to Aug. 20, 1991, has been disclaimed.

Int. Cl. C04b *35/46, 35/48*

U.S. Cl. 252—62.9 **4 Claims**

1. A piezoelectric ceramic composition consisting essentially of a material represented by the formula:

$$Pb(Zn_{1/3}Nb_{2/3})_A(Sn_{1/3}Nb_{2/3})_BTi_CZr_DO_3$$

wherein the range for A, B, C, and D are $0.01 \leqq A \leqq 0.50$, $0.01 \leqq B \leqq 0.25$, $0.25 \leqq C \leqq 0.625$, $0.20 \leqq D \leqq 0.625$, and wherein A+B+C+D=1, and further containing a quantity of manganese equivalent to from 0.05 to 5 weight percent of manganese dioxide (MnO_2).

3,890,242
ANTIBACTERIAL DETERGENT COMPOSITIONS CONTAINING PHENYLBISMUTH BIS(2-PYRIDINETHIOL 1-OXIDE)

John Downing Curry, Oxford, Ohio, assignor to Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 218,584, Jan. 17, 1972, Pat. No. 3,753,990, which is a continuation-in-part of Ser. No. 98,086, Dec. 14, 1970, abandoned. This application Mar. 30, 1973, Ser. No. 346,396

Claims priority, application Netherlands, Apr. 4, 1972, 7204437; France, Apr. 7, 1972, 72.12388; Germany, Apr. 7, 1972, 16725; Sweden, Apr. 10, 1972, 4611/72; United Kingdom, Apr. 13, 1972, 17088/72

Int. Cl. C11d *3/48*

U.S. Cl. 252—107 **6 Claims**

1. An antibacterial and antifungal detergent composition comprising:

A. a water-soluble detergent selected from the group consisting of soaps and non-soap synthetic detergents; and

B. from about 0.2 to about 3% of phenylbismuth bis(2-pyridinethiol 1-oxide);

said detergent composition having a pH of less than about 10.

3,890,243
REMOVAL OF COBALT FROM NICKEL SALT SOLUTIONS

Louis Gandon; Christian Bozec, and Philippe Lenoble, all of Le Havre, France, assignors to Le Nickel, Paris, France

Division of Ser. No. 62,579, Aug. 10, 1970, abandoned. This application Sept. 19, 1972, Ser. No. 290,377

Int. Cl. C01g *53/06*

U.S. Cl. 252—186 **7 Claims**

1. A composition suitable for use as an oxidizing agent in an aqueous saline solution comprising a major portion of a basic nickel III carbonate having the formula

$$_{,}Ni_2(CO_3)_3 \cdot y\ Ni_2O_3 \cdot z\ H_2O$$

wherein y is between 3 and 10 and z is between 4 and 10, and a minor portion of a basic nickel II carbonate having the formula

$$NiCO_3 \cdot x\ Ni(OH)_2$$

wherein x is between 0.5 and 2.

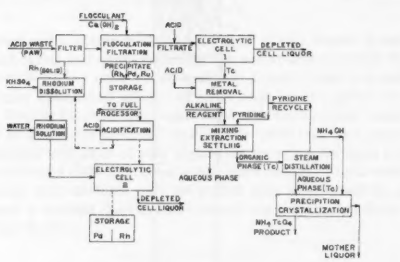
3,890,244
RECOVERY OF TECHNETIUM FROM NUCLEAR FUEL WASTES

William W. Carlin, Portland, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 24, 1972, Ser. No. 309,048

Int. Cl. C02c *5/14*

U.S. Cl. 252—301.1 R **16 Claims**



1. A process for separating technetium values from aqueous acidic solution containing said metal values and other fission product metal values, which comprises mixing with said acidic solution alkaline flocculating reagent selected from alkaline earth metal oxides and hydroxides in amounts sufficient to raise the pH of the solution to between about 9 and about 12 and thereby form a precipitate containing fission product metal values and a supernatant phase containing technetium values, separating the supernatant from the precipitate, acidifying the supernatant with mineral acid to an acid concentration of not more than about 1 molar, electrolyzing acidified supernatant in an electrolytic cell under controlled cathodic potential conditions and at a potential sufficient to deposit technetium on the cathode, removing technetium depleted supernatant from the electrolytic cell and removing elemental technetium deposits from the cathode.

3,890,245
PROCEDURE FOR INCREASING THE CHEMISORPTION CAPACITY OF CARBON WITH REGARD TO GASES

Ronald Berg, Oslo; Hans Petter Hjermstad, Rykkinn, and Gerard Albert Neeljes, Strommen, all of Norway, assignors to Institutt for Atomenergi, Kjeller, Norway

Claims priority, application Norway, July 12, 1972, 2482/72; Norway, July 25, 1973, 2622/73

Filed July 11, 1973, Ser. No. 378,161

Int. Cl. B01d *53/02*

U.S. Cl. 252—447 **2 Claims**

1. A process for increasing the chemisorption capacity of carbon comprising:

impregnating carbon with a quantity of at least one metallic compound effective for increasing the sorption capacity of the carbon; and

irradiating said impregnated carbon with a dosage of at least 1 Mrad of gamma radiation in the presence of nitrogen.

3,890,246

CATALYSTS FOR THE OXIDATION OF OLEFINS TO UNSATURATED ALDEHYDES

Robert K. Grasselli, Chagrin Falls, and Maria S. Friedrich, Cleveland, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 16,984, March 5, 1970, which is a continuation of Ser. No. 691,992, Dec. 20, 1967, Pat. No. 3,544,616. This application Dec. 7, 1971, Ser. No. 205,706

Int. Cl. B01j *11/82, 11/06*

U.S. Cl. 252—432 **4 Claims**

1. A catalyst composition consisting essentially of a catalyst support supporting an activated catalytic oxide complex of arsenic and uranium having a composition corresponding to the empirical chemical formula $U_xAs_yO_z$ where x is a number from about 1 to about 25; y is a number within the range from about 1 to about 10; z is a number taken to satisfy the average valences of arsenic and uranium in the oxidation states in which they exist in said catalyst, said catalyst being formed by heating the mixed oxides of arsenic and uranium in the presence of oxygen at an elevated temperature above 500°F but below their melting point for a time sufficient to form said active catalytic oxide.

3,890,247

HYDROCRACKING CATALYST

Dean Arthur Young, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 209,440, Dec. 17, 1971, abandoned, which is a continuation-in-part of Ser. No. 869,389, Oct. 24, 1969, abandoned, which is a continuation-in-part of Ser. No. 669,288, Sept. 20, 1967, abandoned. This application Oct. 20, 1972, Ser. No. 299,190

Int. Cl. B01j *11/40*

U.S. Cl. 252—455 Z **9 Claims**

1. A hydrocarbon conversion catalyst comprising a crystalline aluminosilicate zeolite base intimately composited with at least one finely divided Group VIB metal hydrogenating component, said hydrogenating component or a precursor thereof having been initially composited with said zeolite base in a substantially undissolved particulate form by intimately admixing the two components in an aqueous medium having a pH below 5, but sufficiently high to avoid acid destruction of the zeolite crystal structure.

3,890,248

CATALYTIC OXIDE ADAPTED FOR THE PREPARATION OF UNSATURATED CARBONYL COMPOUNDS

Takashi Ohara, Nishinomiya; Michikazu Ninomiya, Kobe; Isao Yanagisawa, Toyonaka Ikeda; Michio Ueshima, Nishinomiya, and Masahiro Takata, Toyonaka Ikeda, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Division of Ser. No. 211,680, Dec. 23, 1971, Pat. No. 3,799,978. This application Aug. 29, 1973, Ser. No. 392,500

Int. Cl. B01j *11/06, 11/32, 11/22*

U.S. Cl. 252—456 **2 Claims**

1. A catalyst composition consisting essentially of a catalytic oxide in which the atomic ratio among the constituent elements Co:Fe:Bi:W:Mo:Si:Z is within the range of 2.0–20.0 : 0.1–10.0 : 0.1–10.0 : 0.5–10.0: 2.0–11.5 : 1–15.0 : 0.005–1.0, with the proviso that W plus Mo equals 12.0, and Z represents an alkaline earth metal and the oxygen content of the catalytic oxide is determined by the valence requirements of the other elements present.

3,890,249

SILICA PREPARATION

Richard E. Dietz, Bartlesville, and Joseph A. Delap, Dewey, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 29, 1972, Ser. No. 310,450

Int. Cl. B01j *11/06, 11/36*

U.S. Cl. 252—458 **9 Claims**

1. A method of preparing a silica-containing xerogel which comprises:

a. contacting a silica-containing hydrogel with an organic solvent in which water is soluble said solvent at a first temperataure elevated above the atmospheric boiling point of said organic solvent said solvent being maintained in the liquid phase by superatmosheric pressure, to remove water from said hydrogel and to form a xerogel and to form a solvent-water solution;

b. separating said solvent-water solution from said xerogel;

c. cooling said solvent-water solution to a second temperature less than said first temperature to form a water-rich phase and a solvent-rich phase; and

d. recovering the silica-containing xerogel.

3,890,250

HOT PRESSED SILICON NITRIDE CONTAINING FINELY DISPERSED SILICON CARBIDE OR SILICON ALUMINUM OXYNITRIDE

David W. Richerson, Auburn, Mass., assignor to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 340,948, March 14, 1973, abandoned. This application Aug. 27, 1973, Ser. No. 392,094

Int. Cl. H01b *1/04*

U.S. Cl. 252—516 **13 Claims**

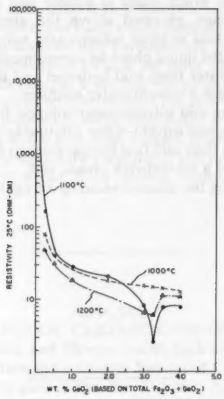
1. Monolithic, high density silicon nitride product whose silicon nitride is predominantly beta phase, the product containing between 10 and 50 percent silicon carbide, the product having interengaged matrices of silicon nitride and silicon carbide, the product being characterized by a modulus of rupture, in excess of 100,000 p.s.i. at 20°C as measured by four point flexure testing, and in excess of 40,000 p.s.i. at 1375°C as measured by three point testing, the product having an electrical resistivity between 1 and 1×10^7 ohm centimeters.

9. Monolithic, high density product comprising a mixture of silicon carbide and at least one compound containing silicon and nitrogen and having the beta silicon nitride structure, said compound being selected from the group consisting of beta silicon nitride and silicon aluminum oxynitride having an expanded beta silicon nitride structure, the product containing between 10 and 50 percent silicon carbide, the product having interengaged matrices of silicon carbide and said compound the product being characterized by a modulus of rupture in excess of 70,000 p.s.i. at 20°C as measured by three point flexure testing, the silicon carbide particles having an average size of 1 micron or less as indicated on photomicrograph at 1000× magnification, the product having an electrical resistivity between 1 and 1×10^7 ohm centimeters.

3,890,251
SEMICONDUCTIVE OXIDES

Frank Knowles Patterson, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Oct. 15, 1973, Ser. No. 406,303
Int. Cl. H01b 1/08
U.S. Cl. 252—519 8 Claims



1. Semiconductive oxides of the hexagonal alpha-Fe_2O_3 crystal structure having the formula $Fe_{2-x}Ge_xO_3$, wherein x is in the range 0.0001–0.05.

3,890,252
SHAPED ARTICLES OF CRYSTALLINE COPOLYMERS OF CIS-1,4-DIHALO-2,3-EPOXYBUTANE

Edwin J. Vandenberg, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 314,287, Dec. 12, 1972, abandoned. This application Mar. 18, 1974, Ser. No. 452,487
Int. Cl. C08g 23/02
U.S. Cl. 260—2 A 7 Claims

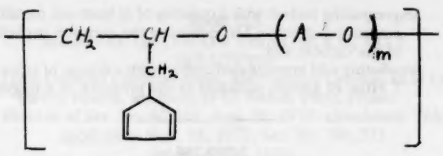
1. A shaped article of a high molecular weight, crystalline copolymer of a cis-1,4-dihalo-2,3-epoxybutane and from about 0.5 to about 5 weight % of at least one other monomer which is a halogen-substituted alkylene oxide or oxetane containing at least 4 carbon atoms, said copolymer having a crystallization half-time greater than the homopolymer of said cis-1,4-dihalo-2,3-epoxybutane.

3,890,253
REVERSIBLY CROSSLINKED POLYMERS

Yasuhiro Takeshita; Michitake Uoi; Yoshiyuki Hirai, and Mitsuru Uchiyama, all of Chiba, Japan, assignors to Idemitsu Kosan Co. Ltd., Tokyo, Japan

Division of Ser. No. 210,834, Dec. 22, 1971, Pat. No. 3,826,760. This application Feb. 27, 1974, Ser. No. 446,502
Claims priority, application Japan, Dec. 26, 1970, 45-128474; Dec. 26, 1970, 45-128475; Sept. 29, 1971, 46-75427; Sept. 29, 1971, 46-75428
Int. Cl. C08g 23/20
U.S. Cl. 260—2 A 2 Claims

1. A self-curing polyether characterized in that it contains recurring units of the general formula:

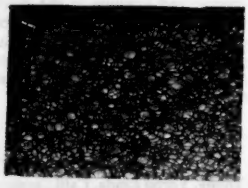


wherein A represents a lower alkylene group and m represents zero or a positive integer of at least 1.

3,890,254
METHOD OF RETICULATING URETHANE FOAM AND PRODUCT

James L. Guthrie, Ashton, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Feb. 13, 1973, Ser. No. 332,053
Int. Cl. C08g 22/48; C08j 22/14
U.S. Cl. 260—2.5 BD 9 Claims



1. A method for preparing improved crosslinked reticulated hydrophilic foam having three-dimensional networks, said method comprising reacting a first component comprising isocyanate capped polyoxyethylene polyol having a reaction functionality greater than two, with a second component comprising aqueous reactant, the ratio of moles H_2O/moles NCO groups being about 6.5 to about 390 in said second and first components respectively, said first component containing monomeric organic polyisocyanate reticulating agent and a soluble or dispersible nonionic surfactant, said reticulating agent being present in an amount from about 2% by weight to about 35% by weight of the said isocyanate capped polyol, said surfactant being selected from the group consisting of (a) block copolymers of poly(oxyethylene) groups condensed onto ends of essentially water-insoluble poly (oxypropylene) chain, and (b) oxyethylated straight chain alcohol and being present in an amount from 0.1 to about 10% by weight of the isocyanate capped polyoxyethylene polyol, the polyoxyethylene polyol moiety of the isocyanate capped member having a weight average molecular weight of about 200 to about 20,000 and a hydroxyl functionality of about 2 to about 8, and recovering a reticulated foam product having cells which together provide a skeletal structure formed of a network of interconnected platelets, ribbons or strands.

3,890,255
CURE CATALYZED POLYURETHANE COMPOSITION

Bruce G. van Leuwen, Hamden, and Donald G. Powell, Woodbridge, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed May 31, 1973, Ser. No. 365,418
Int. Cl. C08g 22/08, 22/16
U.S. Cl. 260—2.5 AQ 9 Claims

1. In a flexible polyurethane foam prepared by the process which comprises reacting, in the presence a reaction catalyst, a foaming agent, and a curing agent, an organic polyisocyanate with an oxypropylated oxyethylated polyether triol characterized by (1) a molecular weight of about 5,800–6,600, (2)

an aliphatic triol nucleus, (3) polyoxypropylene chain segments attached through one end thereof to said nucleus, and (4) polyoxyethylene chain segments attached through one end thereof to said polyoxypropylene chain segments, with the proviso that said polyether triol contains about 7–18 moles of said ethylene oxide per every mole of said aliphatic triol,

the improvement of employing as said curing agent an oxyalkylated alkanolamine, in a proportion of about 1–6 parts per every 100 parts by weight of said polyether triol, said oxyalkylated alkanolamine being substantially free of primary hydroxy groups, having a hydroxyl number of about 390–570, and being the product of condensing an alkylene oxide, selected from the group consisting of propylene oxide, butylene oxide and a mixture thereof, with an alkanolamine selected from the group consisting of an ethanolamine, a propanolamine and an ethanol-propanolamine.

3,890,256
COPOLYESTER PREPARED BY CONTACTING ACYLOXY BENZOIC ACID WITH A POLYESTER OF ETHYLENE GLYCOL AND DICARBOXYLIC ACID

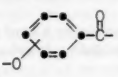
Finley E. McFarlane, and Thomas G. Davis, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 7, 1974, Ser. No. 477,381
Int. Cl. C08g *17/02, 17/08*
U.S. Cl. 260—47 C **8 Claims**

1. A copolyester having an inherent viscosity of at least 0.4 measured at 25°C. using 0.50 gram of polymer per 100 ml. of a solvent composed of 60 volumes of phenol and 40 volumes of tetrachloroethane and having no substantial amount of either aliphatic to aromatic oxygen linkages or aromatic to aromatic oxygen linkages, the copolyester being comprised of the following divalent radicals:

(A)

(B) $-OCH_2CH_2O-$

(C) 

(D) $-O-R_2-O-$

wherein

R_1 is a divalent alicyclic radical having 4 to 20 carbon atoms, a divalent aliphatic radical having 1 to 40 carbon atoms, or a divalent aromatic radical having 6 to 16 carbon atoms with the carbonyl linkages separated by at least 3 carbon atoms, with the proviso that at least 50 mole percent of R_1 is the divalent aromatic radical,

R_2 is a carbocyclic aromatic nucleus wherein the chain extending oxygen linkages are coaxial or parallel and are oppositely directed,

the range of radical (C) plus radical (D) is from about 30 to about 75 mole percent, based on the total moles of radical (B), radical (C) and radical (D) combined,

the amount of radical (D) is not greater than 30 mole percent, based on the total moles of radical (B), radical (C) and radical (D) combined,

in radical (C) the oxygen is linked either in the meta or para position with regard to the carbonyl group, and

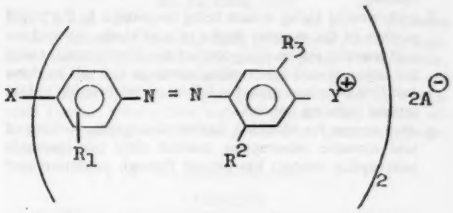
at least 60 mole percent of radical (C) is the para isomer.

3,890,257
YELLOW TO ORANGE DISAZO CATIONIC DYES CONTAINING TWO QUATERNARY AMMONIUM GROUPS

Daniel Shaw James, Hockessin, Del., assignor to E. I. du Pont de Nemours and Co., Wilmington, Del.

Filed Sept. 19, 1973, Ser. No. 398,575
Int. Cl. C09b *35/04, 35/22, 35/26*
U.S. Cl. 260—148 **17 Claims**

1. A dye having the formula



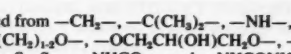
wherein

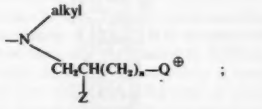
X is selected from $-CH_2-$, $-C(CH_3)_2-$, $-NH-$, $-O-$, $-OCH_2(CH_2)_{1,2}O-$, $-OCH_2CH(OH)CH_2O-$, $-SO_2-$, $-S-$, $-S-S-$, $-NHCO-$, and $-NHCONH-$;

R_1 is selected from H, CH_3, C_2H_5, Cl, and Br;

R_2 is selected from H, alkyl, alkoxy, Cl, NHCO-alkyl, and $NHCOC_6H_5$;

R_3 is selected from H, alkyl, and alkoxy;

$Y^{\oplus}$ is 



wherein

n is 0 or 1;

Z is H when n is 0 and Z is OH when n is 1;

Q^+ is selected from $NR_4R_5R_6$, and $NHCOCH_2NR_4R_5R_6$;

R_4 is selected from alkyl, and hydroxyalkyl;

R_5 is selected from alkyl, hydroxyalkyl, and cyclohexyl;

R_6 is selected from H, alkyl and benzyl;

R_4 and R_5 form an alicyclic ring;

A^- is an anion; the alkyl, alkoxy, NHCOalkyl and hydroxyalkyl substituents refer to such substituents having 1 to 4 carbon atoms.

3,890,258
ELECTRIC CIRCUIT BREAKER WITH SERIES CONNECTED INTERRUPTING AND ISOLATING BREAKS

Richard H. Miller, Berwyn, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed June 28, 1974, Ser. No. 484,181
Int. Cl. H01b *33/68*
U.S. Cl. 200—150 R **8 Claims**

1. An electric circuit breaker comprising:

a. a pair of separable interrupting contacts relatively movable between engaged and disengaged positions,

b. opening spring means biasing a movable one of said interrupting contacts from an engaged position toward a disengaged position,

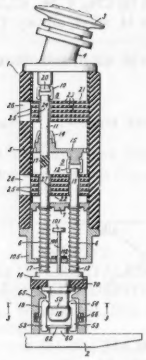
c. first and second isolating contacts electrically in series with said interrupting contacts and relatively movable between engaged and disengaged positions, said first isolating contact being mechanically coupled to said movable interrupting contact,

d. a movable blade member carrying said second isolating contact and providing a path through which closing force is applied to said movable inerrupting contact during circuit-breaker closing,

e. means for driving said blade and said second isolating contact through an opening stroke during circuit-breaker opening,

f. said opening spring means being responsive to the initial portion of the opening stroke of said blade: (i) to drive said movable interrupting contact out of engagement with the other of said interrupting contacts and (ii) to drive said first isolating contact in follow-up relationship to said second isolating contact,

g. stop means for blocking further disengaging motion of said movable interrupting contact after said movable interrupting contact has moved through predetermined



opening travel and for blocking further follow-up motion of said first isolating contact, thereby causing continued opening travel of said blade to separate said isolating contacts,

h. and means for coupling said blade to said movable interrupting contact during the initial portion of said opening stroke so that opening force can then be transmitted from said blade to said movable interrupting contact through said coupling means,

i. said coupling means comprising a shoulder on one of said isolating contacts and fingers forming a part of the other of said isolating contacts having portions engaging said shoulder in a manner such as to interfere with relative motion of said isolating contacts in a disengaging direction,

j. said finger portions being urged into engagement with said shoulder during circuit-breaker opening with a force varying in magnitude directly with the value of current through said isolating contacts, said force opposing relative motion of said isolating contacts in a disengaging direction.

3,890,259

ACIDIC OLEO-ACRYLIC RESINS AND PROCESSES FOR PREPARING SAME

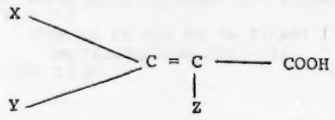
Giorgio Montesissa, and Giancarlo Del Signore, both of Piacenza, Italy, assignors to Duco S.p.A., Trieste, Italy

Filed Apr. 8, 1974, Ser. No. 456,950
Int. Cl. C08f *19/14*
U.S. Cl. 260—23 H **14 Claims**

1. An acidic resin consisting essentially of the product obtained by reacting, at a temperature between about 250° and 300°C,

I. at least one poly-unsaturated monocarboxylic fatty acid having from 9 to 20 carbon atoms and more than one olefinic double bond or an ester of said acid with a polyvalent alcohol or a mixture of said acids and esters with

II. an α,β-unsaturated monocarboxylic acid of the formula:



wherein X and Y are independently selected from the group consisting of hydrogen and alkyl groups having from 1 to 3 carbon atoms, and Z is hydrogen or methyl group, the reaction being carried out by admixing the α,β-unsaturated monocarboxylic acid to component (I) in an amount such that in the reaction mixture, the weight ratio of free α,β-unsaturated acid to combined α,β-unsaturated acid is between 0.1 and 1; and wherein the α,β-unsaturated monocarboxylic acid constitutes between 5 and 25 percent by weight of the product, said product having an acid value ranging from 60 to 300, a viscosity value between P and Z_{10} on the Gardner-Holdt scale, and being substantially free of homopolymers of the α,β-unsaturated monocarboxylic acid.

3,890,260

STABILIZED POLYBUTADIENE RESINS

Delmar F. Lohr, Jr.; John William Fieldhouse, and Edward Leo Kay, all of Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Apr. 16, 1973, Ser. No. 351,690
Int. Cl. C08d *11/04*
U.S. Cl. 260—23.7 R **6 Claims**

1. A composition curable to a hard resin having enhanced resistance to thermo-oxidative deterioration, which composition comprises

	Parts by Weight
A butadiene homopolymer or copolymer resin	100
Vinyltriacetoxysilane	0.05–5.0
Silica	100–500
Zinc bis(N-substituted-beta-aminoethanethioate)	0.5–5.0
Calcium stearate	0.5–5.0
A peroxide curing agent	0.5–6.0

the N-substituent being phenyl or N-phenyl-4-aminophenyl, and the resin being a homopolymer of butadiene or a copolymer of butadiene and styrene and containing at least 40 percent by weight of butadiene, and at least 80 percent of butadiene repeating units in the homopolymer being in the 1,2-configuration; the curing agent being a peroxide which gives radicals of the structure $R_2(CH_3)CO.$ in which each R represents a hydrocarbon radical containing 1 to 20 carbon atoms.

4. A peroxide-cured resin highly resistant to thermooxidative deterioration of physical properties, said resin containing

therein

	Parts by Weight
A butadiene homopolymer or copolymer resin	100
Vinyltriacetoxysilane	0.5–5.0
Silica	100–500
Zinc bis(N-[substituted-beta] phenyl-2-aminoethanethioate)	0.5–5.0
Calcium stearate	0.5–5.0

the substituent being aniline or paraphenylenediamine and the resin being a homopolymer of butadiene or a copolymer of butadiene and styrene and containing at least 40 percent by weight of butadiene, and at least 80 percent of butadiene repeating units in the homopolymer or copolymer being in the 1,2-configuration, the resin having been cured by a peroxide which gives radicals of the structure $R_2(CH_3)CO$. in which each R represents a hydrocarbon radical containing 1 to 20 carbon atoms.

3,890,261

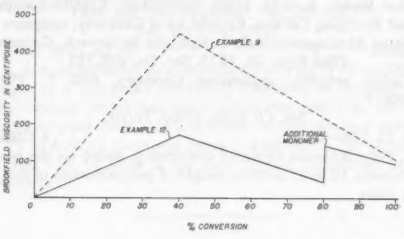
HIGH SOLIDS CHLOROPRENE POLYMER LATEX

Kenneth D. Fitzgerald, Sugarland, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 305,191, Nov. 9, 1972, abandoned. This application Apr. 15, 1974, Ser. No. 461,041

Int. Cl. C08c *11/72*; **C08d** *9/14*

U.S. Cl. 260—23.7 H **25 Claims**



1. A process for the production of high solids latexes having greater than 55 percent by weight of solids which comprises 1. polymerizing monomers comprising chloroprene containing up to 25 percent by weight of another ethylenically unsaturated organic monomer copolymerizable with chloroprene in an aqueous emulsion containing 60 to 90 percent of the total of said monomer, 100 percent of the total of water, and salts of cations selected from the group consisting of alkali metals, ammonia and mixtures thereof (a) from 0.15 to 1.0 parts of a fatty acid member selected from the group consisting of unpolymerized fatty acid, polymerized fatty acids and mixtures thereof (b) from 0.30 to 4.0 parts of a formaldehyde condensate of a naphthalene sulfonic acid and (c) from 1.4 to 4.0 parts of a rosin member selected from the group consisting of rosins, disproportionated rosins and polymerized rosins until the viscosity of the polymerization mixture reaches a peak viscosity;

2. determining said peak viscosity has been reached;

3. continuing said polymerization until said viscosity at least begins to decline; and

4. adding the remaining monomer and continuing polymerization to to form a chloroprene polymer latex having greater than 55 percent solids by weight; provided the weight parts of said (a) are based on the weight of said fatty acid member, the weight parts of said (b) are based on the weight of said salt calculated as a salt and the weight parts of said (c) are based on the weight of said rosin member with all of the weights of (a), (b) and (c) being based on 100 parts of monomer charged up to the time of said peak viscosity.

3,890,262

PYROGENOUS RESIDUE-NOVOLAC FIBERS

James Economy, Eggertsville; Francis J. Frechette, Tonawanda; Ruey Y. Lin, Williamsville, and Luis C. Wohrer, Lewistown, all of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Continuation of Ser. No. 253,603, May 15, 1972, abandoned. This application Apr. 11, 1974, Ser. No. 460,244

Int. Cl. C08g *51/52*

U.S. Cl. 260—28 **9 Claims**

1. An infusible fiber comprising an aldehyde cured homogeneous blend of from about 5 to about 40 percent of a novolac, said novolac having a molecular weight ranging from about 500 to about 1,200, and a pyrogenous residue having a beta-resin content greater than about 5 percent, said residue selected from the group consisting of coal tar pitch and pyrogenous asphalts.

3,890,263

METHOD OF PRODUCING A THERMOPLASTIC COMPOSITION COMPRISING ESSENTIALLY BITUMEN AND AN ELASTOMER, AND PRODUCT THUS OBTAINED

Jean-Yves Meynard, Cormenon, France, assignor to Societe Nouvelle Siplast, Paris, France

Filed May 8, 1974, Ser. No. 468,262

Claims priority, application France, May 11, 1973, 73.17159

Int. Cl.² C08L *95/00*

U.S. Cl. 260—28.5 AS **31 Claims**

1. A method of producing a thermoplastic composition comprising bitumen, an elastomer and possibly a mineral filler, by using a dissolving intermediary, wherein there is used as an elastomer a random ethylene-propylene copolymer referred to as EPR including the random ethylene-propylene-diene terpolymer referred to as EPDM of which the diene component is selected from the group consisting of hexadiene-(1.4), dicyclopentadiene, 5-methylene-norbornene-(2), 5-ethylene-norbornene-(2) and 1-methyl-cyclooctadiene, said EPR copolymer consisting of 54 to 77% by weight of ethylene, 0 to 5% by weight of diene and the balance to 100% by weight of propylene, a solid dissolving intermediary is used which consists of at least one polyolefin, saturated or unsaturated, linear or branched, having a mean molecular weight within the range of 2,000 to 500,000 and selected from the group consisting of polyethylene, isotactic polypropylene and atactic polypropylene, said elastomer is mixed up with said dissolving intermediary in the proportions of 99 to 50% by weight of said elastomer and 1 to 50% by weight of said dissolving intermediary, at a temperature at least equal to the softening temperature of said dissolving intermediary, which ranges from 70° to 150°C in the case of polyethylenes and from 150° to 160°C for polypropylenes, the mixture is subsequently granulated to a particle size of about 2 to 3 mm., to yield a granulated elastomer and dissolving intermediary pre-mixture, whereafter said granulated pre-mixture is kneaded with said bitumen and said possible mineral filler, in the proportions of 1 to 15% by weight of said pre-mixture granular substance, 99 to 35% by weight of said bitumen and 0 to 50% by weight of said mineral filler, provided that the total of these three component elements is 100% by weight, at a temperature within the range of 180° to 250°C, in order to obtain a fine particulate dispersion of said granulated pre-mixture in the bitume n mass, said bitumen being of petroleum origin and having a penetration at 25°C of 1 to 500 according to the French standard NF T 66 004.

14. A thermoplastic composition produced by applying the method set forth in claim 1, consisting of 99 to 35% by weight of bitumen of petroleum origin having a penetration of 1 to 500 at 25°C according to the French standard NF T 66 004; of 1 to 15% by weight of fine particles dispersed through the

mass of said bitumen and consisting of a mixture of 99 to 50% by weight of a random ethylene-propylene copolymer referred to as EPR, including the random ethylene-propylene-diene terpolymer referred to as EPDM, wherein said diene component element is selected from the group consisting of hexadiene-(1.4), dicyclopentadiene, 5-methylene-norbornene-(2), 5-ethylidene-norbornene-(2) and 1-methyl-cyclooctadiene, said EPR copolymer having an ethylene content of 54 to 77% by weight, a diene content of 0 to 5% by weight, and a propylene content to make the balance to 100% by weight and a Mooney viscosity ML (1+4) at 121°C of 60 to 70, and 1to 50% by weight of at least one saturated or unsaturated polyolefin containing or not side chains and having a mean molecular weight within the range of 2,000 to 500,000, said polyolefin being selected from the group consisting of polyethylene, isotactic polypropylene and atactic polypropylene; and of 0 to 50% by weight of a mineral filler, provided that the total of the three component elements corresponds to 100% by weight.

3,890,264

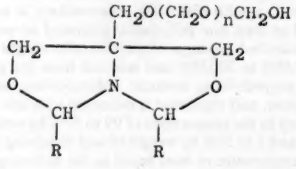
SURFACE-COATING COMPOSITIONS CONTAINING POLYOXYMETHYLENEOXAZOLIDINES

Henri Sidi, Paramus, and Hilding R. Johnson, Wayne, both of N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Mar. 4, 1974, Ser. No. 447,797
Int. Cl. C08f *45/60*
U.S. Cl. 260—29.6 HN **18 Claims**

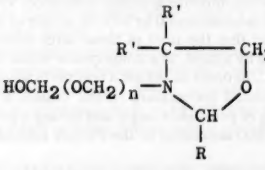
1. A surface-coating composition having improved resistance to attack by bacteria and fungi that comprises (a) a water-insoluble, film-forming, resinous binder selected from the group consisting of synthetic linear addition polymers prepared by the emulsion polymerization of ethylenically-unsaturated monomers, oleoresinous binders, and mixtures thereof and (b) 0.1 percent to 3 percent, based on the weight of the composition of a biocidal component comprising a polyoxymethyleneoxazolidine selected from the group consisting of

(i) compounds having the structural formula



wherein each R represents hydrogen, alkyl of 1 to 6 carbon atoms, phenyl, halophenyl or $-(CH_2O)_mCH_2OH$; *m* represents a number in the range of 0 to 2; and *n* represents a number in the range of 1 to 4;

ii. compounds having the structural formula



wherein each R′ represents alkyl of 1 to 6 carbon atoms or $-CH_2OH$ and R and n have the aforementioned significance; and

iii. mixtures thereof.

3,890,265

METHOD AND COMPOSITIONS FOR PROTECTING SURFACES

John Francis Corrigan, Pennant Hills, New South Wales, Australia, assignor to Enamel Varnish & Chemical Company of Australia Pty. Limited, Blacktown, New South Wales, Australia

Filed Sept. 7, 1972, Ser. No. 287,079
Int. Cl. C08g *51/04*
U.S. Cl. 260—33.6 UB **8 Claims**

1. A two-part primer composition adapted to be mixed immediately prior to use and applied to under-water metal surfaces for the protection thereof of which one part is a moisture-curing polyurethane and the second part is a suspension of a dense pigment which is a non-reactive metal with a high specific gravity in a mixture of a polyvinylbutyral binder, a solvent and phosphoric acid, said solvent being an organic solvent which dissolves the binder and is compatible with the phosphoric acid.

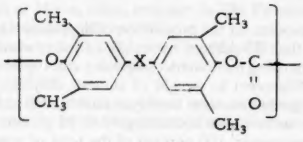
3,890,266

POLYCARBONATE MIXTURES

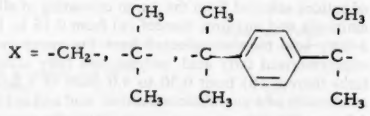
Volker Serini, Krefeld; Hugo Vernaleken, Krefeld-Bockum, and Wolfgang Cohnen, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Germany

Filed Sept. 26, 1973, Ser. No. 400,757
Claims priority, application Germany, Oct. 5, 1972, 2248817
Int. Cl. C08g *39/00, 51/10*
U.S. Cl. 260—37 PC **6 Claims**

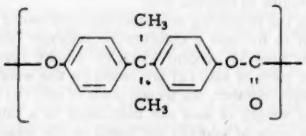
1. Polycarbonate mixtures comprising, based on the polycarbonate, 10 to 95 parts by weight of polycarbonate of recurring units:



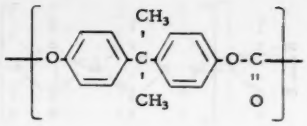
where



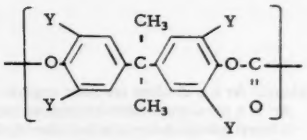
and 90 to 5 parts by weight of (1) homopolycarbonate of recurring units:



or (2) copolycarbonates of recurring units:



and



where

Y = Cl, Br

and wherein there are at least two of the former unit per latter unit, and each of polycarbonates in said mixtures has an average molecular weight, M_w, above 20,000.

3,890,267

MOLDING MATERIAL

Mitio Fukushima, Suita, and Teruo Iwanami, Takatsuki, both of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 30, 1973, Ser. No. 355,528

Int. Cl. C08f *45/10*

U.S. Cl. 260—42.18 **3 Claims**

1. A molding material consisting essentially of 95 to 20% by weight of a copolymer consisting essentially of ethylene and vinyl acetate which has been hydrolyzed and 5 to 80% by weight of glass fiber, said copolymer having ethylene content of 15 to 60% by mole and being hydrolyzed to the extent of at least 98% by mole of the vinyl acetate component of the copolymer.

3,890,268

WEATHER RESISTANT POLYVINYL CHLORIDE COMPOUNDS AND METHOD OF MAKING SAME

James D. Tanzilli, Avon Lake, and Arthur F. Korney, Rocky River, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Sept. 7, 1973, Ser. No. 395,225

Int. Cl. C08f *45/04*

U.S. Cl. 260—42.29 **10 Claims**

1. A rigid vinyl chloride polymeric composition having improved weathering characteristics comprising a vinyl chloride polymer and about 5 to 20 weight parts of titanium dioxide per 100 weight parts of vinyl chloride polymer wherein said titanium dioxide contains about 10 to 60% by weight anatase titanium dioxide and about 40 to 90% by weight rutile titanium dioxide.

3,890,269

PROCESS FOR PREPARING AMINOFUNCTIONAL POLYSILOXANE POLYMERS

Eugene Ray Martin, Onsted, Mich., assignor to Stauffer Chemical Company, Adrian, Mich.

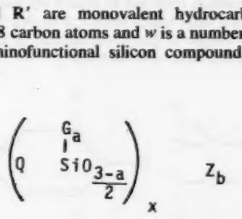
Continuation-in-part of Ser. No. 279,911, Aug. 11, 1972, abandoned. This application Mar. 18, 1974, Ser. No. 452,036

Int. Cl. C08f *11/04*

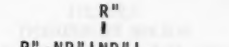
U.S. Cl. 260—46.5 E **23 Claims**

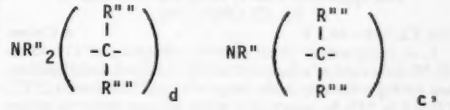
1. A process for preparing aminofunctional polysiloxanes which comprises equilibrating a mixture containing a cyclic organopolysiloxane of the formula

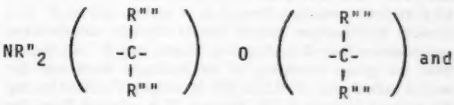
where R and R′ are monovalent hydrocarbon radicals having up to 18 carbon atoms and *w* is a number of from 3 to 10 and an aminofunctional silicon compound represented by the formula

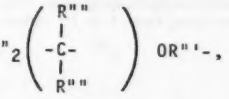


wherein G is selected from the group consisting of R, OR″, $OSiR_3$ and $OR'''NR''_2$ in which R is the same as above, R″ is selected from the group consisting of hydrogen and monovalent hydrocarbon radicals having from 1 to 18 carbon atoms, R‴ is selected from the group consisting of divalent hydrocarbon radicals, divalent hydrocarbonoxy radicals in which the oxygen is in the form of an ether linkage and unsaturated divalent hydrocarbon radicals, Q is selected from the group consisting of R''_2NR'''—,









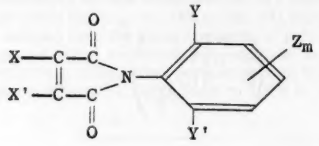
R⁗ is selected from the group consisting of R and hydrogen, Z is selected from the class consisting of $R''O_{0.5}$, $R_3SiO_{0.5}$ and $R''NR'''O_{0.5}$, *a* is a number of from 0 to 2, *b* is a number of from 0 to 3, *c* is a number of from 1 to 10, *d* is a number of from 1 to 10 and *x* is a number of from 1 to 20,000 in the presence of a catalyst selected from the group consisting of alkali metal hydrides, alkali metal alkyls, alkali metal alkenyls and alkali metal aryls.

3,890,270
POLYVINYL HALIDE RESIN COMPOSITIONS

Pasquale P. Minieri, Woodside, N.Y., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Apr. 10, 1974, Ser. No. 459,812
Int. Cl. C08f *45/60*
U.S. Cl. 260—45.8 N 19 Claims

1. A composition resistant to attack by bacteria and fungi that comprises a vinyl halide resin and from 0.01 to 2 percent, based on the weight of the composition, of a biocidal compound having the structural formula



where X and X′ each represents hydrogen or halogen; Y and Y′ each represents alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, nitro, or benzyl; Z represents alkyl of 1 to 4 carbon atoms, halogen or nitro; and *m* represents a number in the range of 0 to 3.

3,890,271
POLISH INGREDIENT

John G. Kokoszka, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 330,375, Feb. 7, 1973, Pat. No. 3,836,371. This application Feb. 1, 1974, Ser. No. 438,806
Int. Cl. C08f *11/04*
U.S. Cl. 260—46.5 R 6 Claims

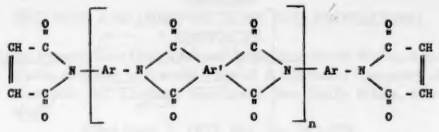
1. A composition which consists essentially of (1) 45 to 99.5% by weight of a hydroxyl endblocked polydimethylsiloxane having a viscosity in the range of 10 to 15,000 cs. at 25°C., (2) 0.3 to 35% by weight of a silane selected from the group consisting of those having the general formulae $(RO)_3SiR'NHR''$ and $(RO)_3SiR'NHCH_2CH_2NH_2$ wherein R is an alkyl radical containing from 1 to 4 carbon atoms, R′ is a divalent hydrocarbon radical free of aliphatic unsaturation and contains from 3 to 4 carbon atoms, and R″ is selected from the group consisting of the hydrogen atom and the methyl radical, and (3) 0.2 to 25% by weight of a silane having the general formula X_3SiZ wherein X is selected from the group consisting of alkoxy and acyloxy radicals containing from 1 to 4 carbon atoms and Z is a nonhydrolyzable radical selected from the group consisting of hydrocarbon radicals, halogenated hydrocarbon radicals and radicals composed of carbon, hydrogen and oxygen atoms wherein the oxygen atoms are present in hydroxyl groups, ester groups or ether linkages, there being from 1 to 10 carbon atoms in the Z radical.

3,890,272
POLYMERIZING BIS-MALEIMIDES

Gaetano Francis D'Alelio, South Bend, Ind., assignor to University of Notre Dame du Lac, South Bend, Ind.

Filed May 25, 1973, Ser. No. 363,799
Int. Cl. C08g *20/32*
U.S. Cl. 260—47 UA 21 Claims

1. A process for converting a bis-maleimide of the formula:



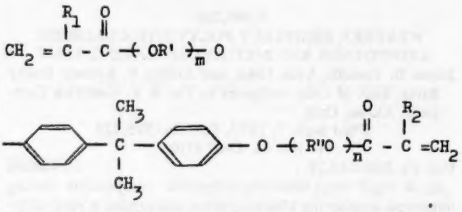
wherein Ar is a divalent aromatic organic radical,
Ar′ is a tetravalent aromatic organic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to adjacent carbon atoms in the Ar′ radical,
and
n is 0 or a positive integer of 1 to 20,
to a higher molecular weight polymer comprising: polymerizing said bis-maleimide at a temperature in the range of 85° to 275°C. in the presence of about 0.01 to 5% by weight of the bis-maleimide of an alkali metal salt of a Bronsted acid, said alkali metal salt of a Bronsted acid selected from the group consisting of an alkali metal salt of an organic Bronsted acid having a pk_a in the range of about 4 to 6, an alkali metal cyanide and an alkali metal carbonate.

3,890,273
ANAEROBICALLY CURABLE SEALING COMPOSITION CONTAINING 2,2-BIS(4-ACRYLOXY-ALKOXY PHENYL) PROPANE

Tsutomu Saito, Tokyo, Japan, assignor to Three Bond Co. Ltd., Tokyo, Japan

Filed Apr. 26, 1974, Ser. No. 464,343
Claims priority, application Japan, Dec. 19, 1973, 48-142652
Int. Cl. C08f *3/62*
U.S. Cl. 260—47 UA 16 Claims

1. An anaerobically curable sealing composition consisting essentially of 100 parts by weight of a polymeric monomer having the general formula of



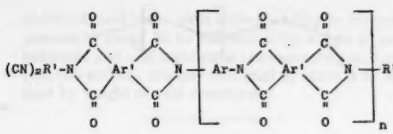
wherein, R_1 and R_2 represent hydrogen or alkyl radicals, respectively, R′ and R″ represent alkylene radicals having from 2 to 4 carbon atoms, respectively, and m and n represent, respectively, an integer of from 2 to 8, 0.2 to 3 parts by weight of an organic peroxide, 0.05 to 0.5 part by weight of n-dodecyl mercaptan, 0.2 to 2 parts by weight of O-sulfobenzoic imide, and 0.1 to 1 part by weight of 2,6-di-tertiary butyl p-cresol.

3,890,274
PHTHALONITRILE-TERMINATED AROMATIC POLYIMIDES

Gaetano Francis D'Alelio, South Bend, Ind., assignor to University of Notre Dame du Lac, Notre Dame, Ind.

Filed Oct. 11, 1974, Ser. No. 514,256
Int. Cl. C08g *20/32*
U.S. Cl. 260—47 CP 7 Claims

1. A phthalonitrile-terminated aromatic polyimide having the structural formula:



wherein

Ar is a divalent aromatic organic radical,

Ar′ is a tetravalent aromatic organic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to adjacent carbon atoms in the Ar′ radical,

R′ is an aromatic organic radical, the two cyano groups being ortho in the aromatic radical and

n is a positive integer of at least 1.

3,890,275

IMIDOMETHYL PHOSPHONATES

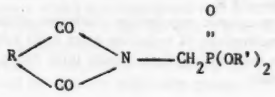
Peter Golborn, Skelmersdale, England, and James J. Duffy, Buffalo, N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 239,760, March 30, 1972, Pat. No. 3,849,440. This application Aug. 2, 1974, Ser. No. 494,109

Int. Cl. C08f *45/60;* **C08g** *51/60;* **C09k** *3/28*

U.S. Cl. 260—45.8 NE **16 Claims**

1. An article comprising a resin compound and a flame retardant amount of a compound of the formula



wherein R′ is selected from the group consisting of phenyl, lower alkenyl and halogen substituted and unsubstituted lower alkyl of 1 to 6 carbon atoms and R is selected from the group consisting of lower alkenylene and lower alkylene of 1 to 8 carbon atoms, wherein only 2 carbon atoms in said group form annular members of the imide rings.

3,890,276

SYNERGISTIC COMBINATIONS OF ORGANIC STABILIZERS FOR HALOGENATED RESINS

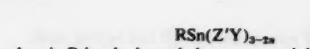
Christian H. Stapfer, Newtown, Pa., assignor to Cincinnati Milacron Chemicals Inc., Reading, Ohio

Continuation of Ser. No. 825,048, May 15, 1969, abandoned, which is a continuation-in-part of Ser. Nos. 729,456, May 15, 1968, Pat. No. 3,544,510, and Ser. No. 780,888, Dec. 3, 1968, Pat. No. 3,630,993. This application Apr. 24, 1973, Ser. No. 354,130

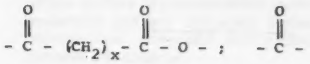
Int. Cl.[2] C08F *45/62*

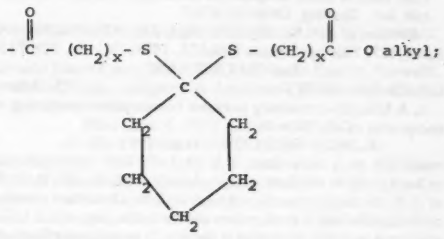
U.S. Cl. 260—45.75 S **17 Claims**

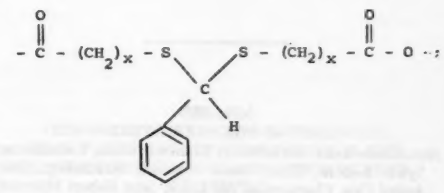
1. A halogen-containing resin composition comprising a resin selected from the group consisting of chlorinated polyethylene, polyvinyl halides, polyvinylidene chloride and copolymers of vinyl chloride with copolymerizable ethylenically unsaturated monomers stabilized with from 0.1 to 10 weight percent of a synergistic combination of (a) an organic divalent-sulfur compound selected from the group consisting of mercaptals, mercaptols, mercaptans, mercaptocarboxylates and sulfides, said sulfides consisting of carbon, oxygen, hydrogen and sulfur, and (b) a mono-hydrocarbyltin compound corresponding to the formula

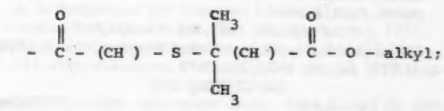


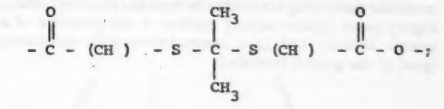
wherein R is a hydrocarbyl group containing 1 to 12 carbons, Z and Z′ are independently selected from the group consisting of oxygen and sulfur, Y is selected from the group consisting of, when at least one of Z and Z′ is sulfur, alkyl having 1 to 12 carbons; —$(CH_2)_xCOO$ alkyl, when *n* is 0;

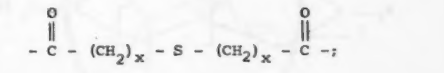




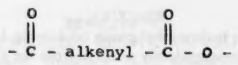








and



n is a number from 0 to 1½ varying, in increments of ½ and *x* is 1 to 3, and the amount of (b) present in said combination being about 1 to about 25 weight percent of the weight of (a).

3,890,277
ALKYLTIN POLYSULFIDE THIOESTER STABILIZED COMPOSITION

Thomas G. Kugele, Cincinnati, and Robert E. Bresser, Sharonville, both of Ohio, assignors to Cincinnati Milacron Chemicals Inc., Reading, Ohio

Division of Ser. No. 400,127, Sept. 24, 1973, Pat. No. 3,869,487. This application Sept. 23, 1974, Ser. No. 508,713
Int. Cl.[2] C08F *45/62*
U.S. Cl. 260—45.75 S **15 Claims**

1. A halogen-containing polymer composition containing a compound of the formula:

$$(R_xSn)_n(-SR'COOR'')(4-x)n-2m(-S_y-)_m$$

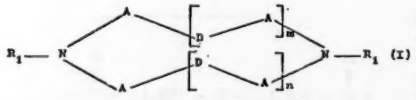
where the tin is tetravalent, R is alkyl of 1 to 8 carbon atoms or benzyl, R′ is alkylene of 1 to 4 carbon atoms, R″ is alkyl of 1 to 18 carbon atoms, alkenyl of 2 to 18 carbon atoms, cycloalkyl having 5 to 6 carbon atoms in the ring, *x* is 1 to 2, *y* is 2 to 4, *n* is 1 to 10 and *m* is ½*n* to n in an amount effective to heat stabilize the polymer.

3,890,278
ANIONIC POLYMERIZATION

Jean-Marie Lehn, Strasbourg; Francois Schue, Lutzelhouse; Sylvie Boileau, Paris; Bernd Kaempf, Strasbourg; Alain André Cau, Chateauneuf sur Loire; Jean Robert Moinard, Vert le Petit, and Serge Fernand Raynal, Villejuif, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

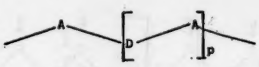
Filed Sept. 26, 1973, Ser. No. 401,119
Claims priority, application United Kingdom, Oct. 3, 1972, 45482/72; July 30, 1973, 36257/73
Int. Cl. C08g *1/12*
U.S. Cl. 260—63 R **27 Claims**

1. A process for the polymerization or copolymerization of of at least one monomer containing ethylenic unsaturation which comprises polymerizing or copolymerizing at least one monomer containing ethylenic unsaturation in a non-polar or slightly polar organic solvent medium in the presence of an anionic initiator and of a macro-heterocyclic complexing agent of the general formula I

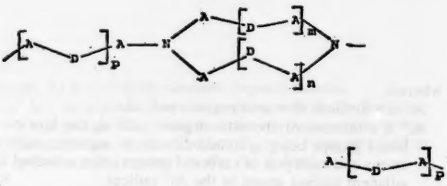


in which:

R_1 is a hydrogen atom or a hydrocarbon group or an alkoxycarbonyl group, or the two R_1 together can form a group of the general formula:



or



A is a hydrocarbon group,

D is an oxygen or sulphur atomor a hydrocarbon group, with the proviso that at least two of the D groups are oxygen atoms or sulphur atoms and that if R_1 is a hydrogen atom, a hydrocarbon group or an alkoxycarbonyl group, one of the two D groups is oxygen or sulphur and the other is oxygen, and *n* and *p* are integers from 1 to 3 and *m* is 2 or 3.

3,890,279
THERMOPLASTIC COPOLYESTER ELASTOMER

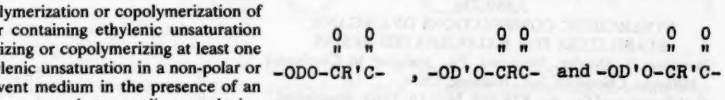
James Richard Wolfe, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.

Filed Dec. 10, 1973, Ser. No. 423,017
Int. Cl. C08g *17/08*
U.S. Cl. 260—75 R **9 Claims**

1. A thermoplastic copolyester elastomer consisting essentially of a multiplicity of recurring ester units joined head-to-tail through ester linkages, said ester units being represented by the formula:

(a)

and at least one other formula selected from the group consisting of:



(b) (c) (d)

wherein:

R is a divalent radical remaining after removal of carboxyl groups from a symmetrical aromatic dicarboxylic acid having a molecular weight less than about 300;

R′ is a divalent radical, containing at least one side chain of 7 to about 30 carbon atoms in length, remaining after removal of carboxyl groups from a dicarboxylic acid having a molecular weight of less than about 300 neglecting the side chains;

D is a divalent radical remaining after removal of hydroxyl groups from 1,4-butanediol; and

D′ is a divalent radical, having at least one side chain of 7 to about 30 carbon atoms in length, remaining after removal of hydroxyl groups from a diol having a molecular weight of less than about 250 neglecting the side chains;

provided, said ester units corresponding to formula (a) amount to about 30 to 95 percent by weight of said copolyester and said ester units corresponding to formulae (b), (c) and (d) amount to a total of about 5 to 70 percent by weight of said copolyester.

3,890,280

POLYMERIZATION OF 2-PYRROLIDONE WITH ALKALI METAL BICARBONATE AS CATALYST

Janardan D. Upadhyaya, Stamford, Conn., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 814,197, April 7, 1969, abandoned. This application May 15, 1970, Ser. No. 37,935

Claims priority, application South Africa, Mar. 31, 1970, 70/2153

Int. Cl. C08g *20/16*

U.S. Cl. 260—78 P **14 Claims**

1. A process for the production of a polymer of 2-pyrrolidone in solid form, which consists essentially of heating a mixture of 2-pyrrolidone and an alkali metal bicarbonate polymerization catalyst to a temperature of at least about 120°C, and then polymerizing the 2-pyrrolidone in the presence of said catalyst.

3,890,281

POLYMERIC CATALYST COMPOSITION FOR HYDROCARBON OXIDATION

Howard P. Angstadt, Media, and John P. Bare, Wilmington, both of Del., assignors to Sun Ventures, Inc., St. Davids, Pa.

Continuation-in-part of Ser. No. 217,945, Jan. 14, 1972, abandoned. This application June 25, 1974, Ser. No. 482,920

Int. Cl. C08g *22/02*

U.S. Cl. 260—77.5 C **13 Claims**

1. As a novel composition, a water-stable polymer having a non-metal containing backbone, said backbone containing functional groups which are complexed with a metal of any of Group IB to VIIIB, or IIA of the Periodic Table, said polymer being further characterized in being a catalyst for the autoxidation of organic compounds containing carbon-hydrogen bonds activated by adjacent activating groups.

3,890,282

METHOD OF PREPARING HANDLEABLE, MOLDABLE RESIN COMPOSITIONS

William J. Heilman, Allison Park, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed June 15, 1973, Ser. No. 370,366

Int. Cl. C08f *1/86, 15/40, 47/00*

U.S. Cl. 260—78.5 T **14 Claims**

1. A method of preparing a handleable, thermosettable, moldable composition which comprises

forming a liquid solution of

a polyanhydride containing at least two succinic anhydride groups and less than three conjugated double bonds when one of the conjugated double bonds is between the carbon atoms alpha to the carbonyl groups in a succinic anhydride group;

an olefinically unsaturated monooxirane compound containing as its only functional groups a single oxirane oxygen atom and an olefinic double bond capable of being polymerized by free radical means;

an olefinically unsaturated monomer free of oxirane oxygen atoms and containing as its only functional groups at least one olefinic double bond capable of polymerization by free radical means; and

a chemical free radical initiator which is thermally activated to generate free radicals at a temperature between about 80° C. and about 120° C.; and

polymerizing at least a portion of said olefinic double bonds of said olefinically unsaturated monooxirane compound and said olefinically unsaturated monomer by free radical means without substantial polymerization of the anhydride groups and the epoxide groups present in the mixture by heating the resin mixture at a thickness no greater than about 10 mm. to a temperature between about 80° C. and about 120° C. and controlling the temperature of the resin mixture within said range whereby substantial vinyl polymerization takes place and cooling the reaction mixture below about 60° C. whereby a handleable, thermosettable, moldable composition comprising a homogeneous mixture of polyanhydride molecules, polyepoxide molecules and any unreacted olefinically unsaturated monooxirane compound and olefinically unsaturated monomer is obtained.

3,890,283

PROCESS FOR POST-POLYMERIZING POLYGLYCOLIC ACID

Donald James Casey, Ridgefield, and Martin Epstein, Norwalk, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed June 4, 1973, Ser. No. 367,043

Int. Cl. C08g *17/017, 53/00, 53/20*

U.S. Cl. 260—78.3 R **5 Claims**

1. A process for increasing the molecular weight of polyglycolic acid comprising heating said polyglycolic acid in a solid state at a temperature between about 150°C. and 220°C. for a period of time of at least 4 days at an absolute pressure between about 0.1 mm. and 1.0 mm. of mercury.

3,890,284

TRIMELLITOYL FUNCTIONAL POLYMERS, MANUFACTURING PROCESS THEREFOR AND ELASTOMERIC EPOXY COMPOSITIONS CURED THEREWITH

Akira Ohnishi; Toshio Yukuta; Ryota Fujio; Yozo Ishida; Shu Kambara, and Minoru Kojima, all of Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

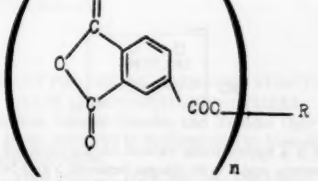
Continuation-in-part of Ser. Nos. 143,643, May 14, 1971, abandoned, Continuation-in-part of Ser. No. 143,645, May 14, 1971, abandoned. This application Aug. 13, 1973, Ser. No. 387,590

Claims priority, application Japan, May 15, 1970, 45-40900; May 15, 1970, 45-40899

Int. Cl. C08g *30/12*

U.S. Cl. 260—78.4 EP **21 Claims**

1. A trimellitoyl functional polymer having the formula



wherein R is a homo- or co-polymeric conjugated diene radical having rubber-like elasticity and having an average molecular weight of 700 to 30,000 and *n* is an integer of at least 2.

3,890,285

PRINTING INK COMPOSITIONS

Masujiro Sumita, and Masatoshi Mori, both of Tokyo, Japan, assignors to Toyo Ink Manufacturing Co., Ltd. and Nippon Oil Co., Ltd., both of Tokyo, Japan

Filed Oct. 19, 1973, Ser. No. 408,197

Claims priority, application Japan, Oct. 20, 1972, 47-104416

Int. Cl. C08f *15/02*

U.S. Cl. 260—78.5 BB 2 Claims

1. A process for the preparation of a resin having an acid number of at least 180 and softening point of 100°–200°C, characterized by reacting a member selected from the group consisting of dicyclopentadiene and methyldicyclopentadiene, with an unsaturated dibasic acid anhydride in molar ratios of from 70/30 to 40/60 at 170°–330°C for 20 minutes to 10 hours.

3,890,286

PRODUCTION OF POLYCAPROAMIDE FIBER

Alex John Bingham, Lake Hiawatha, N.J.; John Christopher Haylock, and Robert Alden Lofquist, both of Richmond, Va., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Dec. 20, 1973, Ser. No. 426,775

Int. Cl. C08g *20/14*

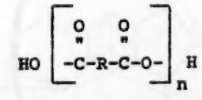
U.S. Cl. 260—78 L 10 Claims

1. In a process for the formation of polycaproamide fiber from a fiber-forming e-polycaproamide polymer having excess number of carboxyl end groups over amino end groups, by extruding the molten polymer through an orifice into a quenching medium and thereafter stretching the resulting filament, the improvement wherein said fiber-forming e-polycaproamide polymer is prepared by a process comprising:

a. continuously forming a molten polymerization reaction mixture at 240°–290°C. from e-caprolactam;

b. continuously smoothly stirring said reaction mixture while flowing over the surface thereof a gas capable of removing moisture from said reaction mixture, at a flow rate of at least 2 unit volumes of said gas, measured at standard temperature and pressure, per hour per each unit volume of said reaction mixture, until the total primary amino group plus carboxyl group analysis of the resulting polymer is not above 135 milliequivalents per kilogram of polymer; and then

c. continuously reacting said polymer at 250°–290°C. with 0.3 to 2.0 weight percent based on the weight of the polymer, of a polyanhydride of a dicarboxylic acid, having the formula



where R is a hydrocarbon radical having between 4 and 18 carbon atoms, and *n* is an integer between 5 and 50, until the primary amino group analysis of the polymer is not above 34 milliequivalents per kilogram of polymer and the carboxyl group analysis of the polymer is between about 50 and about 120 milliequivalents per kilogram of polymer, thereby reducing the occurrence of nubs in the fiber.

3,890,287

POLYSULFONE COPOLYMERS

William R. Moore, and Walter L. Vaughn, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 399,779, Sept. 21, 1973, abandoned. This application June 21, 1974, Ser. No. 481,623

Int. Cl. C08f *13/06*

U.S. Cl. 260—79.3 A 5 Claims

1. An essentially random copolymer consisting of

A. about 10 to 30 percent by weight of SO_2,

B. about 50 to 70 percent by weight of

1. vinyl aromatic monomers having 8–12 carbon atoms,
2. alpha olefins having 8–18 carbon atoms,
3. cycloalkylenes having 4–8 carbon atoms,
4. alkyl acrylates or alkyl methacrylates having 4–12 carbon atoms, or
5. mixtures thereof; and

C. about 10 to 25 percent by weight of monoolefinically unsaturated dicarboxylic acids having 4–7 carbon atoms.

3,890,288

PROCESS FOR MAKING POLY-ALPHA-OXYACRYLIC ACID AND ITS ALKALI METAL SALTS

Wilhelm Vogt, Hurth-Efferen; Edgar Fischer, Frankfurt am Main, and Eberhard Auer, Erftstadt Liblar, all of Germany, assignors to Hoechst Aktiengesellschaft, Knapsack, near Cologne, Germany

Filed June 21, 1974, Ser. No. 481,814

Claims priority, application Germany, Sept. 15, 1973, 2346500

Int. Cl. C08f *3/44*

U.S. Cl. 260—80 P 14 Claims

1. In a process for making poly-α-oxyacrylic acid by contacting a solution of α-chloracrylic acid with radical-yielding polymerization catalysts, heating and thereby hydrolyzing the resulting poly-α-chloracrylic acid in aqueous solution with the resultant precipitation of solid poly-α-oxyacrylic acid and separating the poly-α-oxyacrylic acid, the improvement which comprises contacting an aqueous α-chloracrylic acid solution with the radical-yielding polymerization catalysts for a period of at least 30 minutes and, while leaving the resulting poly-α-chloracrylic acid unseparated, heating it for a period of at least 1 hour to temperatures within the range 80° and 110°C.

3,890,289

AUTOMATIC SCUM REMOVAL TROUGH

Paul R. Johnson, Mineral Wells, Tex., assignor to Harsco Corporation, Harrisburg, Pa.

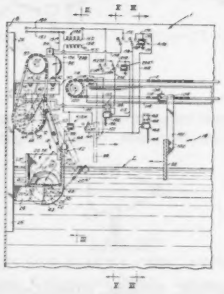
Filed July 15, 1974, Ser. No. 488,422

Int. Cl. B01d *21/24*

U.S. Cl. 210—104 12 Claims

1. Apparatus to remove floating scum from the surface of liquid in a tank comprising: a trough having side walls; support means in the tank secured to the trough, said support means being adapted to permit vertical movement of an edge of one of the sidewalls of the trough; drive means; connector means secured between the drive means and the trough; means to energize said drive means to initiate movement of the edge of the trough in a first direction; liquid sensor means on said trough arranged to de-energize said drive means upon move-

ment of the edge of the trough a predetermined distance below the surface of the liquid in the tank; and means to



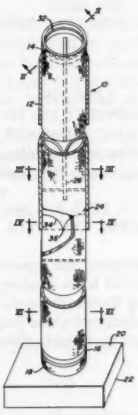
energize said drive means to initiate movement of the edge of the trough in a second direction.

3,890,290

APPARATUS FOR FILTERING PARTICULATE MATTER FROM A FLUID STREAM

Robert V. McCabe, Harrisville, Pa., assignor to ESM, Inc., Valencia, Pa.

Filed Feb. 21, 1974, Ser. No. 444,393
Int. Cl. B01d *29/38*
U.S. Cl. 210—136 **7 Claims**



1. An apparatus for filtering particulate matter from a fluid stream comprising,

a first fabric housing having a longitudinal chamber with an open upper end portion and an open lower end portion adapted to receive said fluid stream,

a second fabric housing having a longitudinal chamber concentrically positioned within said first fabric housing chamber,

said second fabric housing secured at preselected intervals to the interior surface of said first fabric housing such that said chamber thereof is divided into a plurality of separate and distinct longitudinal passageways surrounding said second fabric housing chamber and arranged to receive said fluid stream,

said passageways having sealed upper end portions and open lower end portions,

means for supporting said first fabric housing to receive said fluid stream, and

said fabric housing having a lower end portion converging in a cone,

said cone having an orifice arranged to expand and contract to permit discharge of particulate matter from said second fabric housing chamber through said orifice to said open lower end portion of said first fabric housing chamber.

3,890,291

ALPHA-HYDROXYACRYLIC ACID/ACRYLIC ACID-COPOLYMERS AND A PROCESS FOR MAKING THEM

Wilhelm Vogt, Hurth-Efferen; Eberhard Auer, Erftstadt Liblar; Gunter Lenz, Frechen-Bachem; Karl Merkenich, Hurth-Efferen, and Klaus Henning, Hurth-Hermulheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed May 22, 1974, Ser. No. 472,277
Claims priority, application Germany, May 28, 1973, 2327097
Int. Cl. C08f *15/14*
U.S. Cl. 260—80.3 R **12 Claims**

1. Copolymers of α-hydroxyacrylic acid and acrylic acid, the copolymers containing between about 9 and 85 mol percent of acrylic acid and having a specific viscosity substantially within the range 0.05 and 1.0, determined on 1 weight percent solutions of the copolymers in aqueous 2N-sodium hydroxide solution, at 20°C.

3,890,292

ADHESIVE COMPOSITIONS AND TAPES

Reinhard D. Bohme, Hinsdale, and Perlita A. Ilagan, Chicago, both of Ill., assignors to Daubert Chemical Company, Oak Brook, Ill.

Filed May 23, 1973, Ser. No. 363,013
Int. Cl. C08f *15/40*
U.S. Cl. 260—80.76 **5 Claims**

1. A water dispersible pressure sensitive adhesive composition which in dry form is normally tacky and substantially moisture stable consisting essentially of a copolymer formed of from about 4 to about 10 percent, by weight, of a water soluble alkali metal salt of an α, β unsaturated monocarboxylic acid, from about 6 to about 20 percent, by weight, of a water soluble polyoxyalkylene monoester of an α, β unsaturated monocarboxylic acid, said monoester containing at least two alkylene oxide units, with from about 70 to about 90 percent, by weight, of copolymerizable monomers, said monomers consisting essentially of 0 to about 20 percent, by weight, of an α, β unsaturated monocarboxylic acid, and about 50 to about 90 percent, by weight, of a substantially water insoluble alkyl ester of an α, β unsaturated monocarboxylic acid, or a mixture of a substantially water insoluble alkyl ester of an α, β unsaturated monocarboxylic acid and a vinyl ester, the vinyl ester comprising from about 10 to about 40 percent, by weight, of the mixture.

3,890,293

METHOD OF PRODUCING ALDEHYDE FUNCTIONAL MULTI-COMPONENT COPOLYMERS

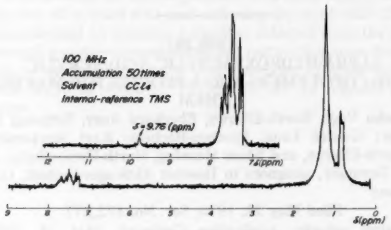
Toshio Yukuta; Takashi Ohashi, and Yoshiko Oguri, all of Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Kyobashi, Japan

Filed May 23, 1972, Ser. No. 256,120
Claims priority, application Japan, June 1, 1971, 46-37479
Int. Cl. C08f *27/22, 27/24*
U.S. Cl. 260—80.78 **9 Claims**

1. An aldehyde functional multi-component copolymer

having aldehyde functional groups in the side chain or in the cyclic group in the main chain, which is obtained

by subjecting a multi-component copolymer composed of 30–85 mol% of ethylene, 15–70 mol% of propylene and 1–10 mol% of at least one non-conjugated diene compound to an ozonolysis in a solvent



at a temperature of −80°C to +60°C with ozone mixed with a carrier gas in a concentration of 0.1 to 0.5% by weight based on the weight of the carrier gas, and then

reducing the resulting mixed peroxides formed by ozonolysis of olefin bond units with a trivalent phosphorus compound in an amount of 0.5 to 3.0 equivalents based on the equivalent of the mixed peroxides.

3,890,294

AZO CONTAINING POLYBUTADIENES

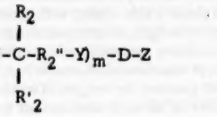
Chester Stephen Sheppard, Tonawanda, and Ronald Edward MacLeay, Williamsville, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 37,311, May 14, 1970, Pat. No. 3,752,802, which is a continuation-in-part of Ser. No. 667,352, Sept. 3, 1967, abandoned. This application Aug. 8, 1973, Ser. No. 386,661

Int. Cl. C08g *27/08*

U.S. Cl. 260—94.7 N **3 Claims**

1. A polymer having the general formula:



where:

a. R′ is t-aliphatic having 4–10 carbon atoms;

b. m is an integer from 1 to 100;

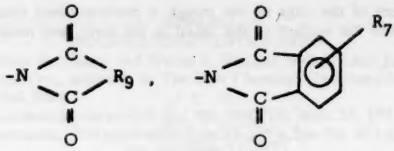
c. Z is a radical selected from —OH, —NH_2, —NHR_2, —SH, —OR_2 and —H;

d. D is a residue having a valence of *m*+1 of polybutadiene;

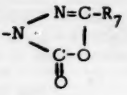
e. Y is a divalent radical selected from —C(=O)O—, —OC(=O)O—, —C(=O)S—, —OC(=O)S—, —C(=O)NH—, —C(=O)N(R_2)—, —OC(=O)NH—, —OC(=O)N(R_2)—, —OC(=O)R_3(COOH)C(=O)O—, —OC(=O)R_3(COOH)C(=O)NH—, —OC(=O)R_3(COOH)C(=O)N(R_2)— and —OC(=O)R_3(COOH)C(=O)S—;

f. R_2 is lower alkyl;

g. R′$_2$ is —CN, —C(=O)OR_6, —OC(=O)R_6, —Cl, —Br, —OC(=O)H, —GC(=G)R_5, —GC(=G)GR_5, —GR_5, —N_3, —SCN, —NCS, —OCN, —OOR_8, —R_5,



or



h. R_2″ is an aliphatic, aromatic, aromatic-aliphatic or cycloaliphatic diradical;

i. R_3 is an aromatic, aliphatic or cycloaliphatic triradical;

j. G is oxygen or sulfur;

k. R_5 is an alkyl or cycloalkyl radical of 1–12 carbons or an aromatic radical of 6–12 carbons;

l. R_6 is lower alkyl;

m. R_7 is H, alkyl or cycloalkyl of 1–10 carbons, or aromatic of 6–12 carbons;

n. R_8 is tertiary aliphatic;

o. R_9 is lower alkylene; and

p. R_2 and R_2″, when taken together with the tertiary carbon atom connected to the azo nitrogen atom, form a cycloaliphatic triradical of 3–10 carbons.

3,890,295

METHODS AND COMPOSITIONS TO ENHANCE TALL OIL SOAP SEPARATION

Hillel Lieberman, Warminster, and Robert J. Ziegler, Churchville, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed June 15, 1973, Ser. No. 370,508

Int. Cl.[2] C09F *7/00;* **C11D** *15/00*

U.S. Cl. 260—97.6 **11 Claims**

1. A method for enhancing the separation of tall oil soap from black liquors derived from alkaline pulping operations which comprises adding thereto from about 5 to about 1000 parts by weight of a polyoxy-ethylene-polyoxypropylene condensate per million parts by weight of said black liquor.

3,890,296

DIHYDROCHALCONE GALACTOSIDES AND THEIR USE AS SWEETENING AGENTS

Robert M. Horowitz, Pasadena, and Bruno Gentili, Glendale, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

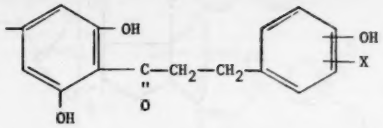
Division of Ser. No. 256,683, May 23, 1972. This application Apr. 8, 1974, Ser. No. 459,141

Int. Cl. C07c *47/18*

U.S. Cl. 260—210 F **2 Claims**

1. A compound of the formula

β-D-galactosyl-O



wherein X represents a radical selected from the group consisting of hydrogen, hydroxy, and lower alkoxy.

3,890,297

PROCESS FOR N-ACYLATING NOVENAMINE

Lester A. Dolak, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 29, 1973, Ser. No. 346,010

Int. Cl. C07c *47/18*

U.S. Cl. 260—210 R **4 Claims**

1. A process for preparing N-acylated novenamine having anti-bacterial activity which comprises contacting novenamine with an acylating agent consisting of a derivative of the desired carboxylic or sulfonic acid in a nitrogen-containing organic base solvent at a temperature of from about −80°C. to about 0°C. and allowing the reaction system to come to ambient temperature.

3,890,298

DIHYDROCHALCONE XYLOSIDES AND THEIR USE AS SWEETENING AGENTS

Robert M. Horowitz, Pasadena, and Bruno Gentili, Glendale, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

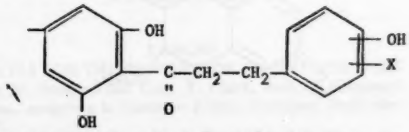
Division of Ser. No. 256,084, May 23, 1972, Pat. No. 3,826,856. This application Apr. 8, 1974, Ser. No. 459,253

Int. Cl. C07c *47/18*

U.S. Cl. 260—210 F **2 Claims**

1. A compound of the formula

β-D-xylosyl-O



wherein X represents a radical selected from the group consisting of hydrogen, hydroxy, and lower alkoxy.

3,890,299

CYTOKININ-7-NUCLEOSIDE

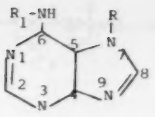
Eugene J. Fox, and James D. McChesney, both of Lawrence, Kans., assignors to Kansas University Endowment Association, Lawrence, Kans.

Filed Sept. 6, 1973, Ser. No. 394,883

Int. Cl.² C07H *19/16, 19/18*

U.S. Cl. 260—211.5 R **7 Claims**

1. A novel cytokinin-7-nucleoside compound of the formula:



wherein R_1 represents a member selected from the group consisting of a $—CH_3$, $—C_3H_5$ group, a $—C_3H_4—C_6H_5$ group, and a $—CH_2Y$ group, wherein Y represents a member selected from the group consisting of a furfuryl group, a pyridyl group, a thiophene group, a C_5–C_7 cycloalkyl group, and a C_5–C_7 cycloalkenyl group, and a $—CH_2—C_6H_4—X$ group, wherein X represents a member selected from the group consisting of an alkyl group of from 1 to 3 carbon atoms, a branched alkyl group of 3 carbon atoms, an alkenyl group of from 1 to 3 carbon atoms, a branched alkenyl group of 3 carbon atoms, a halogen atom, and a CF_3group; and wherein R represents a monosaccharide.

3,890,300

STARCH HYDROLYSATE METHODS FOR ITS PREPARATION AND PRODUCTS BASED THEREON

Michel Huchette, and Guy Fleche, both of Lestrem, France, assignors to Roquette Freres, Lestrem, France

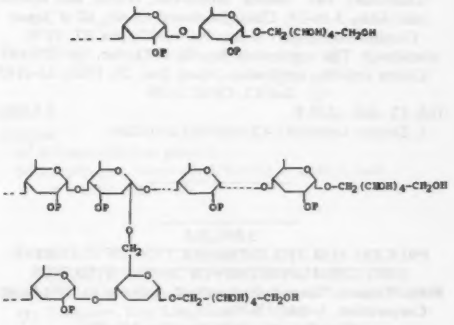
Filed May 11, 1973, Ser. No. 359,514

Claims priority, application France, May 17, 1972, 72.17703

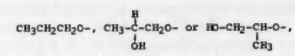
Int. Cl. C08b *19/06*

U.S. Cl. 260—233.3 R **1 Claim**

1. Starch hydrolysate, the constituent linear and branched glucose chains of which are substituted by the propylene oxide radical —OP and the terminal groups of which are hydrogenated as represented on the corresponding structural formula:



said propylene oxide radical —OP representing a group selected from



the degree of substitution of said starch hydrolysate being less than 0.6.

3,890,301

ESTERS OF 4-(HIGH MOLECULAR WEIGHT ALKYL-SUBSTITUTED CARBOPHENOXY) PHTHALIC ACID

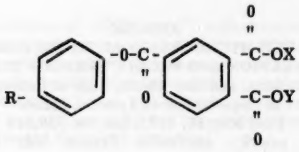
Edmond J. Piasek, Chicago, and Imre Puskas, Glen Ellyn, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Division of Ser. No. 72,831, Sept. 16, 1970. This application Sept. 29, 1972, Ser. No. 293,646

Int. Cl. C07c *65/04*

U.S. Cl. 260—234 R **10 Claims**

1. An ester of 4-(alkylcarbophenoxy)-phthalic acid of the formula:



wherein R the alkyl-substituent has from 30-214 carbon atoms and X is derived from an alcohol or a hydroxyaromatic compound having at least one HO- radical and Y is hydrogen or said X.

3,890,302

DEXTRO 1-METHYL-2-(2-NAPHTHYL) AZIRIDINE

Katsumi Kotera, 1631, Hirose, Shimamoto-cho, Osaka; Keizo Kitahonoki, 848, Nabata, Ikoma-cho, Ikoma, and Ryonosuke Kido, 3-16-28, Chokoji-minami, Osaka, all of Japan

Continuation-in-part of Ser. No. 6,307, Jan. 27, 1970, abandoned. This application June 5, 1972, Ser. No. 259,839

Claims priority, application Japan, Jan. 28, 1969, 44-6147

Int. Cl. C07d *23/06*

U.S. Cl. 260—239 E **1 Claim**

1. Dextro-1-methyl-2-(2-naphthyl)aziridine.

3,890,303

PROCESS FOR THE INTRODUCTION OF FLUORINE INTO THE 21-POSITION OF 20-OXO-STEROIDS

Peter Wieland, Oberwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

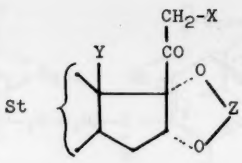
Filed Feb. 15, 1974, Ser. No. 443,054

Claims priority, application Switzerland, Feb. 28, 1973, 2951/73

Int. Cl. C07c *169/30*

U.S. Cl. 260—239.55 D **19 Claims**

1. A process for the introduction of fluorine into the 21-position of 20-oxo-steroids, accompanied by the elimination of a reactive esterified hydroxyl group in the 21-position, wherein a compound of the partial formula



(I)

wherein X represents an hydroxyl group esterified with an organic sulphonic acid or a hydrohalic acid excepting hydrofluoric acid, Y represents a hydrogen atom or a lower aliphatic radical and Z represents a cycloalkylidene radical that contains five to 11 carbon atoms or an alkylidene radical that contains not more than 11 carbon atoms, and if it contains not more than five carbon atoms, can also carry one or two cycloalkyl radicals or phenyl radicals; and St represents the optionally substituted residual part of the steroid skeleton, is treated successively with an agent which is the reaction product of the action of an alkali metal on a polycyclic aromatic hydrocarbon and with perchloryl fluoride in an aprotic solvent.

3,890,304

7-CARBAM OYL-17-HYDROXY-3-OXO-17-PREGN-4-ENE-21-CARBOXYLIC ACID-LACTONE AND RELATED COMPOUNDS

Richard M. Weier, Deerfield, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

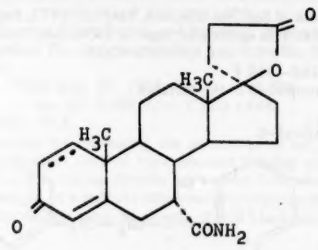
Filed Apr. 25, 1974, Ser. No. 464,253

Claims priority, application Canada, Nov. 9, 1973, 185462

Int. Cl. C07c *173/00, 173/10*

U.S. Cl. 260—239.57 **4 Claims**

1. A compound of the formula



wherein the dotted line indicates the optional presence of a Δ^1 unsaturated linkage.

3,890,305

DIVINYLDIPHENYL COMPOUNDS

Kurt Weber, and Hans Schlapfer, both of Basel, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

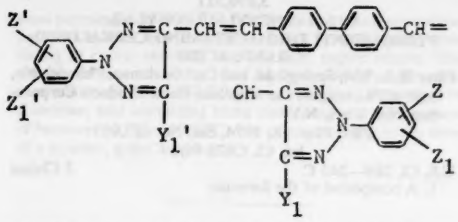
Filed Dec. 18, 1972, Ser. No. 316,155

Claims priority, application Switzerland, Dec. 30, 1971, 19172/71

Int. Cl. C07d *55/02*

U.S. Cl. 260—240 D **7 Claims**

1. A compound of the formula



wherein Y_1 and Y_1' independently of one another denote hydrogen, chlorine, alkyl with 1 to 6 carbon atoms or phenyl, naphthyl or diphenylyl or phenyl, naphthyl or disphenylyl substituted by chlorine, alkyl with 1 to 4 carbon atoms or alkoxy with 1 to 4 carbon atoms, Z and Z' independently of one another denote hydrogen, fluorine, chlorine, bromine, alkyl with 1 to 4 carbon atoms, optionally substituted alkoxy with 1 to 12 carbon atoms, alkenyloxy with 3 or 4 carbon atoms, or benzyloxy and Z_1 and Z_1' independently of one another denote hydrogen, fluorine, chlorine, bromine, alkyl with 1 to 4 carbon atoms are alkoxy with 1 to 4 carbon atoms.

3,890,306

NOVEL ACETALS AND METHODS FOR THEIR PREPARATION

Anthony W. McCollum, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 172,324, Aug. 16, 1971. This application June 20, 1973, Ser. No. 372,881

Int. Cl. C07d *13/04*

U.S. Cl. 260—240 E **18 Claims**

1. The compound 1,1,4,4-bis(ethylenedioxy)-3,3-dimethyl-1-butene.

3. A process for preparing 2-hydroxy-3,3-dimethylsuccinaldehyde bis(ethylenedioxy)acetal which comprises contacting tetrahydro-2-isopropyl-6,6-dimethylfuro-(2,3-d)-1,3-dioxol-5-ol with at least three equivalents of a diol wherein the hydroxy groups are in the 1,2- or 1,3-position, at a temperature greater than about 60°C. and less than about 110°C., in the presence of an acid catalyst selected from the group consisting of p-toluenesulfonic, hydrochloric and sulfuric acid and continuously removing the water liberated during the reaction.

3,890,307

PROCESS FOR THE PRODUCTION OF METHINE DYES

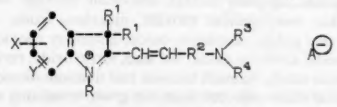
James M. Straley, and Gary T. Clark, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 2, 1973, Ser. No. 347,024

Int. Cl. C09b *23/10, 23/14*

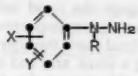
U.S. Cl. 260—240 E **3 Claims**

1. Process for the preparation of methine dyestuffs having the formula



which comprises the steps of

1. heating equimolar amounts of
   a. a phenylhydrazine having the formula

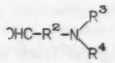


and

b. a ketone having the formula

in the presence of an acidic solvent containing at least one molar equivalent of acid per mole of phenylhydrazine at a temperature from about 50°–180°C. for at least an hour;

2. subsequently adding to the solution an equimolar amount of an aldehyde having the formula



3. heating the reaction mixture for at least 2 hours at a temperature from about 50°–180°C.; and
4. recovering said methine dyestuff;

wherein

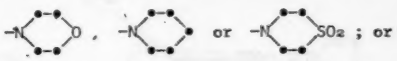
R is lower alkyl or phenyl;

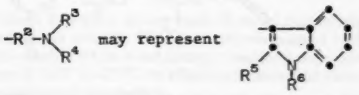
R^1 is lower alkyl;

X and Y are the same or different and each is hydrogen, halo, nitro, lower alkoxy, lower alkyl or lower alkoxycarbonyl;

R^2 is phenylene, phenylene substituted with lower alkyl, halo or lower alkoxy; naphthylene or naphthylene substituted with lower alkyl, halo or lower alkoxy;

R^3 and R^4 are the same or different and each is hydrogen, lower alkyl, phenyl, lower alkyl substituted with halo, hydroxy, cyano, lower alkoxy, acetoxy, succinimido or phthalimido; or R^3 and R^4 together with the nitrogen atom to which they are bonded may represent





wherein

R^5 is lower alkyl or phenyl;

R^6 is hydrogen, lower alkyl, benzyl or phenyl; and

A^- is a basic dye anion.

3,890,308

PLASTIC INJECTION MOLDING MACHINE

Harvey H. Collins, Athol, Mass., assignor to Package Machinery Company, East Longmeadow, Mass.

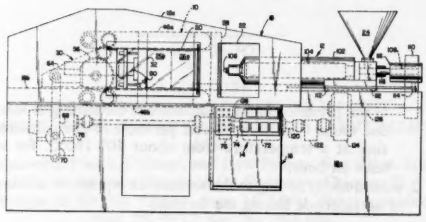
Filed Oct. 12, 1973, Ser. No. 405,815

Int. Cl. B29f *1/00;* **B29c** *1/16*

U.S. Cl. 425—242 R **7 Claims**

1. In a plastic injection molding machine having a longitudinally extending base, a plasticizing and injecting unit, and a fixed die plate mounted transversely on the base and supporting a mold half, a carriage movable longitudinally on the base and supporting a second die plate and complementary mold half, a mechanism for reciprocating the carriage and thereby

to engage and disengage the mold halves, said mechanism comprising at least two toggles respectively disposed on opposite sides of a longitudinal plane through the mold halves, each such toggle including a crank arm and connecting arm which are respectively pivotally connected to the carriage and to the fixed die plate and also to each other, and a common drive for



simultaneously pivoting the crank arms between positions wherein the mold halves are engaged and most widely separated, the first such position being when each toggle is substantially dead center and of shortest length and the second such position being when each toggle is substantially dead center and of greatest length.

3,890,309
CEPHALOSPORIN DERIVATIVES

Michihiko Ochiai, Suita; Osami Aki, Kawanishi; Akira Morimoto, Suita; Taiiti Okada, Kyoto, and Katsutada Masuda, Ashiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

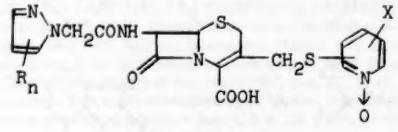
Filed July 12, 1972, Ser. No. 270,985

Claims priority, application Japan, July 12, 1971, 46-51912; Mar. 9, 1972, 47-24305

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **32 Claims**

1. A compound of the formula,



wherein R represents the same or different substituent selected from halogen atom, nitro group, lower alkyl group, amino group or carboxyl group, *n* is an integer from 0 to 3 and X represents hydrogen or halogen atom, or a pharmaceutically acceptable salt thereof.

3,890,310
METHOXYMETHYL 3-METHYL-7-β-PHENOXYACETAMIDO-CEPH-3-EM-4-CARBOXYLATE

Chester Sapino, Jr., East Syracuse, and Mariano Vecchio Ruggeri, Syracuse, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 330,770, Feb. 8, 1973, Pat. No. 3,843,639. This application Mar. 8, 1974, Ser. No. 449,301

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **1 Claim**

1. Methoxymethyl 3-methyl-7-β-phenoxyacetamidoceph-3-em-4-carboxylate.

3,890,311
7-(2-[1-(PHENYLSULFONYL)-2-PYRROLIDINYLTHIO]ACETAMINO)CEPHALOSPORANIC ACIDS

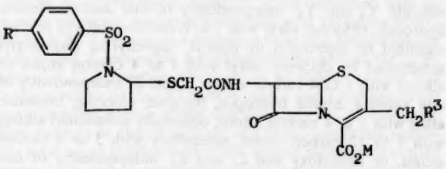
Peter H. L. Wei, Springfield, and Carl Gochman, Philadelphia, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Mar. 18, 1974, Ser. No. 452,011

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **3 Claims**

1. A compound of the formula:



in which

R is a member selected from the group consisting of H, Cl, —Br and —NO_2;

R^3 is a member selected from the group consisting of —H and acetoxy; and

M is a member selected from the group consisting of —H, sodium and potassium.

3,890,312
STABILIZATION AND PURIFICATION OF β-LACTONES

Yasuhiro Ogawa, Suita, and Norio Awata, Settsu, both of Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Japan

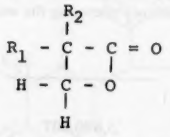
Filed Oct. 30, 1969, Ser. No. 872,727

Claims priority, application Japan, Oct. 30, 1968, 43-79537; Feb. 4, 1969, 44-8332

Int. Cl. C07d *3/00*

U.S. Cl. 260—343.9 **13 Claims**

1. A method for purifying a β-lactone represented by the formula:



wherein each of R_1 and R_2 represent hydrogen, alkyl of 1 to 4 carbon atoms or phenyl, and having impurities selected from the group consisting of carboxylic acids, aldehydes, chlorinated olefins, ketenes, ketene dimers and olefine, which consist essentially of the step of contacting the impure β-lactone with at least one substance selected from the group consisting of (1) a metal oxide selected from the group consisting of berylium oxide, magnesium oxide, calcium oxide, strontium oxide, barium oxide, lead monoxide, manganese oxide, cadmium oxide, tungsten dioxide, chromium trioxide, vanadium pentoxide, molybdenum trioxide, nickelous oxide, cuprous oxide, zinc oxide, aluminum oxide, antimony trioxide, stannous oxide, silverous oxide, red lead, ferric oxide, ceric oxide, zirconium oxide, bismuth trioxide and titanium dioxide, (2) a non-metal oxide selected from the group consisting of boron oxide, silicon oxide, selenium oxide and arsenic trioxide, (3) a mixture of metal and non-metal oxide selected from the group consisting of silica-alumina, silica-zirconia, silica-boria, acid clay, bentonite, kaolin and montmorillonite, (4) potas-

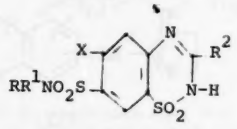
sium permanganate and (5) a mixture of potassium permanganate and at least one metal salt selected from the group consisting of cupric chloride, zinc chloride, cupric nitrate, zinc nitrate and bismuth nitrate; said substance being employed in an amount of 0.05 to 100 % by weight based on the weight of β-lactone; said contacting being conducted at a temperature of between −10°C and 150°C; said substance being in the form of a powder, granule or lump.

3,890,313
3-DIAZINE SUBSTITUTED BENZOTHIADIAZINES

Frederick C. Novello, Berwyn, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 20, 1972, Ser. No. 236,243
Int. Cl. C07d *93/34*
U.S. Cl. 260—243 D **7 Claims**

1. A benzothiadiazine having the structure



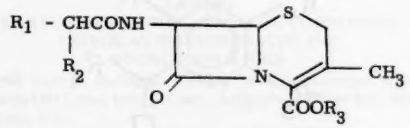
and pharmacologically acceptable salts thereof wherein R is hydrogen or C_{1-5} alkyl; R^1 is hydrogen or C_{1-5} alkyl, R^2 is pyridazinyl or a substituted pyridazinyl derivative wherein the substituent is one or two similar or dissimilar groups selected from C_{1-3} alkyl, lower alkoxy, hydroxy, chloro and bromo; R^4 is hydrogen or C_{1-5} alkyl; and X is halo, C_{1-3} alkyl and trifluoromethyl.

3,890,314
PROCESS FOR PRODUCING 7-ACYLAMINO-3-METHYL-3-CEPHEM-4-CARBOXYLIC ACIDS

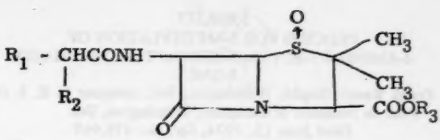
Toshiyasu Ishimaru, Suita, and Yutaka Kodama, Toyama, both of Japan, assignors to Toyama Chemical Co., Ltd., Japan

Filed Aug. 7, 1973, Ser. No. 386,355
Claims priority, application Japan, Sept. 1, 1972, 47-87816
Int. Cl. C07d *99/24*
U.S. Cl. 260—243 C **10 Claims**

1. A process for preparing a 7-acylamino-3-methyl-3-cephem-4-carboxylic acid ester of the formula



wherein R_1 represents hydrogen, lower alkyl having from 1 – 5 carbon atoms, phenyl, or phenyloxy; R_2 represents hydrogen, lower alkyl having from 1 – 5 carbon atoms, halogen, azido, or N-protected amino; and R_3 represents an ester group, which comprises the step of heating 6-acylaminopenicillanic acid ester S-oxide represented by the formula



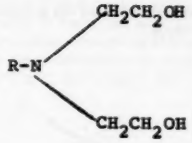
wherein R_1, R_2 and R_3 are as defined before in the presence of a catalyst consisting of an acid selected from the group consisting of phosphoric acids, sulfonic acids and Lewis acids and a sulfide, of the formula $R_5—S—R_6$, the amount of said catalyst being from .05 to 0.2 mole of an acid and from 0.01 to 0.3 mole of a sulfide per mole of said 6-acylamino- penicillanic acid ester S-oxide; wherein R_5 and R_6 are alkyl of 1 to 10 carbon atoms, allyl, vinyl, cyclohexyl, 3,3,5-trimethylcyclohexyl, chloroalkyl of 1 to 2 carbon atoms, hydroxy alkyl of 2 to 3 carbon atoms, carboxy alkyl of 1 to 2 carbon atoms, dodecoxy carbonyl ethyl, cyanoethyl, nitroethyl, mercapto ethyl, aminoethyl, methylthio propyl, methoxyethyl, methylthio ethyl, propargyl, monocarbocyclic aryl or mono carbocyclic aralkyl wherein alkyl has 1 to 2 carbon atoms.

3,890,315
METHOD FOR PREPARING N-SUBSTITUTED MORPHOLINES

Ting P. Chen, Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed June 14, 1972, Ser. No. 262,918
Int. Cl. C07d *87/26, 87/24*
U.S. Cl. 260—247 **8 Claims**

1. A liquid phase method for preparing an N-substituted morpholine which comprises the steps of forming a hydrocarbon solution of an N-substituted bis-(hydroxyethyl) amine represented by the formula:



in which R is alkyl having from 10 to 30 carbon atoms, and passing said solution through a column packed with an alumina catalyst while maintaining a reaction temperature in the range of 340° to 425°C. to effect cyclization and recovering an N-substituted morpholine.

3,890,316
HETEROCYCLIC PEROXIDES

Duane B. Priddy, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 6, 1973, Ser. No. 385,914
Int. Cl. C07d *87/28*
U.S. Cl. 260—247 **1 Claim**

1. A compound of the formula

$$(R'—O—O—R)_nY \qquad (I)$$

wherein

R is a cycloalkylidene radical of 5–7 carbon atoms,

R′ is α,α-dimethylbenzyl, lower alkyl-α,α-dimethylbenzyl,

Y is a heterocyclic radical of the group

4-morpholinyl-,

1-piperidinyl-,

1-pyrrolidinyl, and

n is the valence of Y.

3,890,317
PROCESS FOR S-METHYLATION OF 4-AMINO-6-T-BUTYL-3-MERCAPTO-1,2,4-TRIAZIN-5-ONE

Frank Runar Haglid, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed June 13, 1974, Ser. No. 478,969
Int. Cl. C07d 55/10
U.S. Cl. 260—249.5 7 Claims

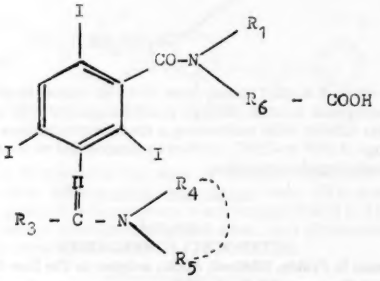
1. In the process for methyl bromide S-methylation of 4-amino-6-t-butyl-3-mercapto-1,2,4-triazin-5-one, the improvement which comprises continuous product removal from the reaction mixture.

3,890,318
DERIVATIVES OF TRIIODO AMINOBENZENECARBOXYLIC ACIDS AND THE PREPARATION THEREOF

Werner Obendorf; Irmgard Lindner; Ernst Schwarzinger, and Josef Krieger, all of Linz, Donau, Austria, assignors to Chemie Linz Aktiengesellschaft, Linz, Donau, Austria

Filed July 20, 1973, Ser. No. 381,337
Claims priority, application Germany, July 21, 1972, 2235935
Int. Cl. C07d 87/42
U.S. Cl. 260—247.2 A 9 Claims

1. A compound selected from the group consisting of compounds of the formula



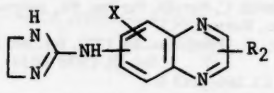
lower alkyl esters thereof and pharmaceutically acceptable salts thereof, wherein R_1 is selected from the group consisting of hydrogen, alkyl of up to 4 carbon atoms, alkenyl of up to 4 carbon atoms and alkoxyalkyl of up to 6 carbon atoms, R_3 is selected from the group consisting of hydrogen and alkyl of up to 4 carbon atoms, R_4 is selected from the group consisting of hydrogen and lower alkyl, R_5 is selected from the group consisting of alkyl of up to 4 carbon atoms, alkenyl of up to 4 carbon atoms and alkoxyalkyl of up to 6 carbon atoms, or R_4 and R_5 together with the nitrogen atom to which they are attached form a group selected from the group consisting of piperidino, pyrrolidino and morpholino and R_6 is alkylene of up to 5 carbon atoms.

3,890,319
(2-IMIDAZOLIN-2-YLAMINO) SUBSTITUTED QUINOLINES, -QUINOXALINES AND -QUINAZOLINES AS ANTIHYPERTENSIVE AGENTS

John C. Danielewicz; Michael Snarey, and Geoffrey N. Thomas, all of Kent, England, assignors to Pfizer Inc., New York, N.Y.

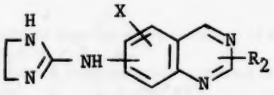
Filed Feb. 14, 1973, Ser. No. 332,485
Claims priority, application United Kingdom, Feb. 29, 1972, 9196/72; Nov. 8, 1972, 51629/72
Int. Cl. C07d 51/78
U.S. Cl. 260—250 Q 9 Claims

1. A compound selected from the group consisting of those having the formulae



II

and



III

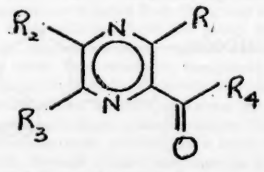
and the pharmaceutically acceptable acid addition salts thereof wherein X is selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy and trifluoromethyl and R_2 is selected from the group consisting of hydrogen, alkyl having 1 to 6 carbon atoms and alkoxy having 1 to 6 carbon atoms.

3,890,320
NOVEL PROCESS FOR PRODUCING 2-ACYL-3-ALKYL PYRAZINES

John Wolt, Freehold, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

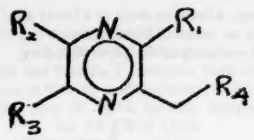
Filed Apr. 23, 1973, Ser. No. 353,779
Int. Cl. C07c 51/76
U.S. Cl. 260—250 B 8 Claims

1. A process for producing a 2-alkanoyl-3-straight chain lower alkyl pyrazine having the structure:



wherein R_1 is C_1–C_3 straight chain lower alkyl; R_2 and R_3 are each the same or different and each is selected from the group consisting of hydrogen and methyl; and R_4 is selected from the group consisting of ethyl and methyl comprising the steps of:

a. Intimately admixing a compound having the structure:

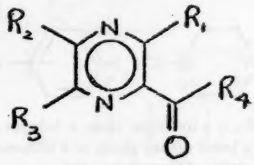


with (1) an alkali metal dichromate and (2) a C_2–C_3 straight chain alkanoic acid;

b. Heating the resulting mixture at a temperature in the range of from 80°up to 160°C; and

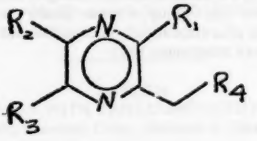
c. Recovering the 2-alkanoyl-3-straight chain lower alkyl pyrazine therefrom.

2. A process for producing a 2-alkanoyl-3-straight chain lower alkyl pyrazine having the structure:



wherein R_1 is C_1–C_3 straight chain lower alkyl; R_2 and R_3 are each the same or different and are each selected from the group consisting of hydrogen and methyl; and R_4 is selected from the group consisting of ethyl and methyl comprising the steps of:

a. Intimately admixing a compound having the structure:



with (1) a material selected from the group consisting of a C_2–C_3 straight chain alkanoic acid and approximately 50 percent aqueous sulfuric acid; and (2) and alkali metal dichromate;

b. Heating the resulting mixture at a temperature in the range of from 80° up to 160°C; and

c. Recovering the 2-alkanoyl-3-straight chain lower alkyl pyrazine therefrom.

3,890,321

6-ARYL-5-ETHYL-PYRIMIDIN-4-OL COMPOUNDS USEFUL AS INTERMEDIATES AND BRONCHODILATORS

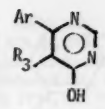
Gerald George DeAngelis, Wilton, and Hans-Jurgen Ernst Hess, Old Lyme, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 182,220, Sept. 20, 1971, which is a continuation-in-part of Ser. No. 78,216, Oct. 5, 1970, Pat. No. 3,707,560. This application June 19, 1973, Ser. No. 371,563

Int. Cl. C07d *51/38*

U.S. Cl. 260—251 R **2 Claims**

1. A compound selected from those of the formula



wherein:

R_3 is ethyl; and

Ar is selected from the group consisting of phenyl; substituted phenyl wherein said substituent is selected from the group consisting of methyl, methoxy, 3,4-dimethoxy, hydroxy, trifluoromethyl, fluorine, chlorine, bromine, cyano, nitro, dialkylamino said alkyl containing from 1 to 3 carbon atoms, amino and alkanoylamino containing from 1 to 4 carbon atoms; pyridyl; thienyl; furyl; monosubstituted pyridyl, thienyl and furyl wherein said substituent is alkanoylamino containing from 1 to 4 carbon atoms; naphthyl; 3-indolyl; 2- and 3-benzothienyl; and 2- and 3-benzofuryl.

3,890,322

1,1-DIMETHYL-2-THIO-3-(4-ALKYL-PIPERAZINO)-THOCARBONYL UREAS

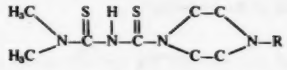
Russell F. Bellina, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed May 8, 1973, Ser. No. 358,394

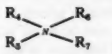
Int. Cl. C07d *5/70*

U.S. Cl. 260—268 C **6 Claims**

1. A compound of the formula.



Wherein R is alkyl of 1 to 6 carbon atoms or salts of these compounds with acids or bases, the acids being selected from those having an ionization constant of at least 1×10^{-7} and the salts formed with bases containing the cation selected from Li^+, Na^+, K^+, $Ca^{++}Cu^{++}$, Zn^{++}, Mg^{++}, Mn^{++}, and



where R_4, R_5, and R_6, are the same or different and represent hydrogen, Alkyl of 1 through 4 carbon atoms or hydroxyl alkyl of 2 through 4 carbon atoms; R_7 is hydrogen, alkyl of 1 through 12 carbon atoms, benzyl, amino, methylamino, or dimethyl amino; R_4 and R_5 taken together to form a ring that is $-(CH_2)_2-$ $O-(CH_2)_2-$ or $-(CH_2)_j-$ where j is 4–6 and R_6 and R_7 are H.

3,890,323

PHENYLKETONE DERIVATIVES

Hisao Yamamoto, Nishinomiya; Shigeho Inaba, Takarazuka; Kikuo Sasajima, Toyonaka; Masaru Nakao, Osaka; Isamu Maruyama, Minoo; Keiichi Ono, Osaka, and Shigenari Katayama, Takarazuka, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Japan

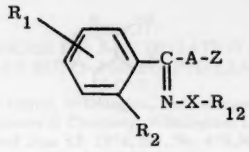
Filed June 13, 1973, Ser. No. 369,461

Claims priority, application Japan, June 14, 1972, 47-59895

Int. Cl. C07d *51/70*

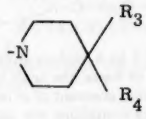
U.S. Cl. 260—268 R **7 Claims**

1. A compound of the formula:

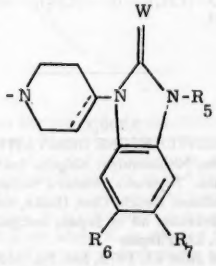


wherein R_1 is a hydrogen atom, a halogen atom, a lower alkyl group, a lower alkoxy group, an amino group, a lower alkylamino group, a di(lower)alkylamino group, a benzylamino group or a trifluoromethyl group, R_2 is a hydrogen atom, a halogen atom, an amino group, an acylamino group selected from the group consisting of a C_1–C_3 alkanoylamino group, a benzoylamino group and a C_1–C_5 alkanoylamino group or benzoylamino group substituted with a substituent selected from the group consisting of hydrogen, halogen, hydroxyl, lower alkyl, lower alkoxy nitro, and trifluoromethyl, and N-lower alkyl-N-acylamino group, of which the acylamino moiety is the acylamino group heretofore defined, a lower alkylamino group, a di(lower)alkylamino group or a nitro group, R_{12} is a hydrogen atom, a lower alkyl group, a carbamoyl group or an aromatic group selected from the group consisting of phenyl, halophenyl, tolyl, and methoxyphenyl, A is a lower alkylene group, X is an oxygen atom or

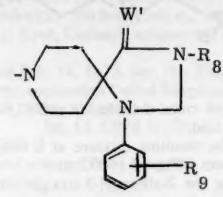
wherein R_{13} is a hydrogen atom, a lower alkyl group or an aromatic group selected from the group consisting of phenyl, halophenyl, tolyl, and methoxyphenyl and Z is a group of either one of the formulas:



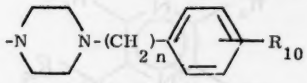
wherein R_3 is a hydrogen atom or a hydroxyl group and R_4 is a hydrogen atom, a phenyl group a benzyl group, a phenyl group substituted with one or more substituents selected from the group consisting of halogen, lower alkyl, lower alkoxy and trifluoromethyl on the benzene ring, and a benzyl group having one or more substituents selected from the group consisting of halogen, lower alkyl, lower alkoxy and trifluoromethyl on the benzene ring.



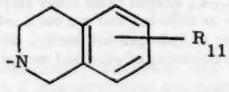
wherein W is two hydrogen atoms or an oxygen atom, R_5 is a hydrogen atom or a lower alkyl group, R_6 and R_7 are each a hydrogen atom, a halogen atom or a lower alkyl group and the dotted line is an optional bond between the carbon atoms at the 3- and 4-positions of the piperidine ring,



wherein W' is two hydrogen atoms or an oxygen atom, R_8 is a hydrogen atom or a lower alkyl group and R_9 is a hydrogen atom, a halogen atom, a lower alkyl group or a lower alkoxy group,



wherein R_{10} is a hydrogen atom, a halogen atom, a lower alkyl group, a lower alkoxy group or a trifluoromethyl group and n is an integer of from 0 to 2, and



wherein R_{11} is a hydrogen atoms, a halogen atom, a hydroxyl group, a lower alkyl group, a lower alkoxy group or a nitro group, and its pharmaceutically acceptable acid addition salts and quaternary ammonium salts.

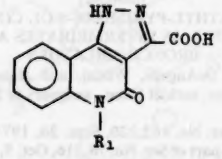
3,890,324

1H-PYRAZOLO[4,3-C]QUINOL-4(5H)-ONE-3-CARBOXYLIC ACIDS

Alan S. Katner, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 12, 1974, Ser. No. 460,641
Int. Cl. C07d *33/48*
U.S. Cl. 260—287 R **10 Claims**

1. A 1H-pyrazolo[4,3-c]quinol-4(5H)-one-3-carboxylic acid of the formula,



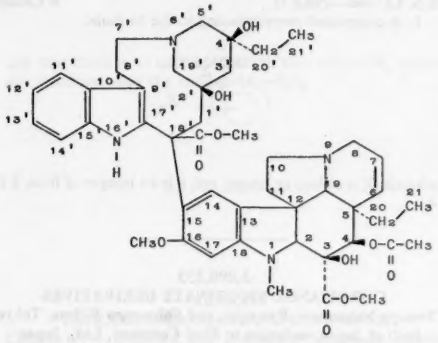
wherein R_1 is a monovalent group selected from the group consisting of methyl, benzyl, and monosubstituted benzyl in which the substituent is fluoro, chloro, or bromo.

3,890,325
LEUROCOLOMBINE

Susan L. Smith, and Douglas E. Dorman, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed May 15, 1974, Ser. No. 469,982
Int. Cl. C07d *33/50*
U.S. Cl. 260—287 R 2 Claims

1. Leurocolombine, represented by the formula:



and a pharmaceutically-acceptable acid addition salt, formed with a non-toxic acid.

3,890,326
BROMINATION WITH TRIFLUOROMETHYLBROMIDE

John H. Tobin, Hamden, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Dec. 13, 1973, Ser. No. 424,394
Int. Cl.[2] C07D *213/26, 213/61;* C07C *17/12*
U.S. Cl. 260—290 HL 11 Claims

1. A process for preparing a brominated aromatic or heteroaromatic compound and fluoroform which comprises reacting a selected reactant with trifluoromethylbromide in the vapor phase and at a temperature of at least 400°C., said reactant being selected from the group consisting of aromatic hydrocarbons and heteroaromatic compounds having 6 to 10 ring atoms consisting of carbon and not more than 2 atoms of nitrogen, said aromatic reactant being substituted with hydrogen and further substituents selected from the group consisting of hydrogen, halogen, perhaloalkyl having 1 to 4 carbon atoms, nitrile and combinations of such further substituents.

3,890,327
TRANS-1,2,3,4,4A;8,9,14A-OCTAHYDROPYRIDO[R',3':2,3]INDOLO[1,7-AB][1]BENZAZEPINE

Joel G. Berger, Freeport, N.Y., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.

Filed May 11, 1973, Ser. No. 359,504
Int. Cl. C07d *57/04*
U.S. Cl. 260—293.55 4 Claims

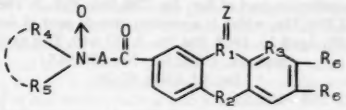
1. Trans-1,2,3,4,4a,8,9,14a-octahydropyrido[4',3':2,3]indolo[1,7-ab][1]benzazepine and acid addition salts thereof with pharmaceutically suitable acids.

3,890,328
N,N-DIOXIDES OF BIS-BASIC CYCLIC KETONES

Frank P. Palopoli, and John P. Paolini, Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Mar. 8, 1974, Ser. No. 449,225
Int. Cl. C07d *29/20*
U.S. Cl. 260—293.62 7 Claims

1. An essentially pure N,N-dioxide of a bis-basic cyclic ketone having the formula



wherein

Z is oxygen or H_2;

R_1 is carbon;

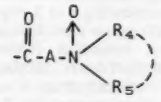
R_2 is a sigma bond or oxygen;

R_3 is methylidyne;

A is a straight or branched alkylene chain having from 2 to 4 carbon atoms;

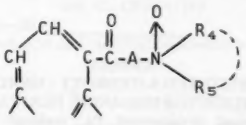
R_4 and R_5 are each selected from the group consisting of lower alkyl having from 1 to 3 carbon atoms and when taken together with the nitrogen atom to which they are attached represent the pyrrolidinyl, piperidino and morpholino group;

R_6 is selected from the group consisting of hydrogen and



with the proviso that one and only one such R_6 group is hydrogen;

R_1, Z and R_3 taken together form the group



when each R_6 is hydrogen and R_2 is a sigma bond; and the pharmaceutically acceptable acid addition salts thereof.

3,890,329
HYDROGENATION PROCESS WITH UNSUPPORTED GROUP VIII METAL HYDROXIDE CATALYSTS

Leo L. Benezra, Mentor, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Feb. 15, 1973, Ser. No. 332,663
Int. Cl. C07d *29/06*
U.S. Cl. 260—293.52 11 Claims

1. An improved process for converting an unsaturated carbocyclic or heterocyclic compound to its more saturated carbocyclic or heterocyclic derivative, which process comprises contacting said unsaturated carbocyclic or heterocyclic compound under a hydrogen pressure ranging from about 100 to 1500 psig, at a temperature of 70°–200° C. and in the absence of a water-soluble alkaline agent, with an unreduced Group VIII metal hydroxide which is unsupported and in an undried state as the sole hydrogenation catalyst, said unreduced Group VIII metal hydroxide having been obtained by first reacting a water-soluble salt of a Group VIII metal se-

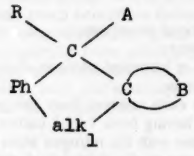
lected from the group consisting of cobalt, ruthenium, palladium, rhodium and nickel with a compound which supplies hydroxyl ions in aqueous solution, and then being isolated from the reaction mixture and washed prior to use.

3,890,330
AMINOALKYL-SP IROCYCLOALKANES

Lincoln Harvey Werner, Summit, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 796,166, Feb. 3, 1969, Pat. No. 3,706,756, which is a continuation-in-part of Ser. No. 723,585, April 23, 1968, Pat. No. 3,657,440. This application Sept. 10, 1971, Ser. No. 179,565
Int. Cl. C07c *87/28*
U.S. Cl. 260—295.5 S **5 Claims**

1. A 1-basically substituted benzcycloalkane-2-spiroaliphatic compound of the formula



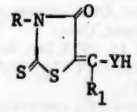
in which Ph is 1,2-phenylene, or 1,2-phenylene substituted by up to two members selected from the group of lower alkyl, hydroxy, lower alkoxy, halogeno, trifluoromethyl or nitro, alk_1 is lower alkylene contributing 1 to 3 ring-carbon atoms, B is lower alkylene or alkenylene contributing 4 to 6 ring-carbon atoms, A is amino, mono- or di-lower alkylamino, N-(hydroxyl-lower alkyl)-N-lower alkylamino, di-(hydroxy-lower alkyl)-amino in which hydroxy is separated from amino by at least 2 carbon atoms, monocyclic, 3 to 7 ring-membered lower cycloalkylamino, cycloalkyl-lower alkylamino, N-cycloalkyl-N-lower alkylamino or N-cycloalkyl-lower alkyl-N-lower alkylamino, HPh-lower alkylamino, or N-lower alkyl-HPh-lower alkylamino-lower alkyl and R is hydrogen or hydroxy, or the N-oxide or therapeutically useful acid addition salts thereof.

3,890,331
3-SUBSTITUTED-5-HYDROXY (MERCAPTO) ALKYLIDENE-RHODANINE DERIVATIVES

Arthur Magnani, Wynnewood, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 254,363, May 18, 1972, abandoned. This application July 13, 1973, Ser. No. 379,037
Int. Cl. C07d *91/16*
U.S. Cl. 260—294.8 D **20 Claims**

1. A chemical compound of the formula:



wherein:

R is lower alkyl of from 1 to 4 carbon atoms, straight or branched chain, cycloalkyl of from 3 to 6 carbon atoms, alkenyl of from 3 to 5 carbon atoms, phenyl, phenylalkyl of from 7 to 9 carbon atoms, monohalophenyl, dichlorophenyl, alkylphenyl, methylchlorophenyl or pyridylmethyl;

R_1 is lower alkyl of from 1 to 4 carbon atoms, phenylalkyl of from 7 to 9 carbon atoms, said alkyl moieties being straight or branched chain, monochlorobenzyl or monomethylbenzyl; and

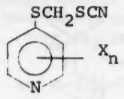
Y is oxygen or sulfur, or a 2-aminopyridine or 2-aminothiazole salt thereof.

3,890,332
HALOPYRIDYL THIOALKYLTHIO CYANATES

Penelope B. Domenico, Fairfax, Va., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 15, 1974, Ser. No. 460,831
Int. Cl. C07d *31/50*
U.S. Cl. 260—294.8 G **6 Claims**

1. A compound corresponding to the formula

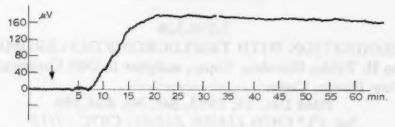


wherein X is chloro or bromo and *n* is an integer of from 2 to 4.

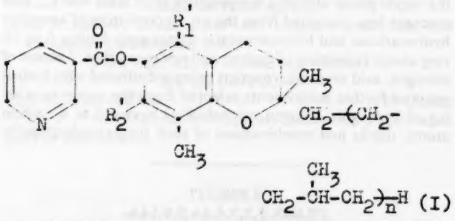
3,890,333
CHROMANOL NICOTINATE DERIVATIVES

Tetsuya Nakamura, Kawagoe, and Shizumasa Kijima, Tokyo, both of Japan, assignors to Eisai Company, Ltd., Japan

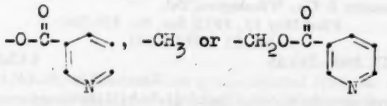
Filed June 13, 1973, Ser. No. 369,432
Claims priority, application Japan, June 24, 1972, 47-62845
Int. Cl.² C07D *213/55*
U.S. Cl. 260—295.5 B **9 Claims**



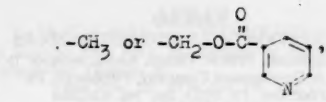
1. Chromanol nicotinate derivatives having the formula:



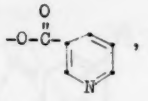
wherein *n* designates 0 or an integer of from 1 to 3; R_1' designates a radical



and R_2' designates a radical —CH_3 or



with the provision that R_2' is $-CH_3$ where R_1' is



and that there is no case where both the radicals R_1' and R_2' are simultaneously the radicals of $-CH_3$.

3,890,334

TETRASILA-ADAMANTANE COMPOUNDS

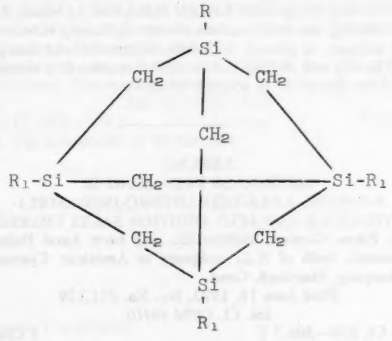
Cecil L. Frye, Midland, and Jerome M. Klosowski, Monitor Twp., Bay County, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 230,937, March 1, 1972, Pat. No. 3,776,915. This application June 22, 1973, Ser. No. 372,561

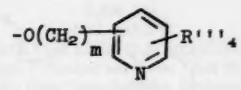
Int. Cl. C07d *103/02*

U.S. Cl. 260—297 F **24 Claims**

1. A tetrasila-adamantane of the formula



in which R is a nitrogen-containing substituent selected from the group consisting of the $-O-Q'-N(R'')_2$ radical wherein Q' is a divalent hydrocarbon radical containing from one to 20 carbon atoms, said divalent radical being selected from the group consisting of alkylene, alkarylene and arylene radicals; and each R'' is selected from the group consisting of the hydrogen atom, monovalent hydrocarbon radicals, said hydrocarbon radical being selected from the group consisting of alkyl of one to 18 carbon atoms, alkenyl of three to 18 carbon atoms, cycloaliphatic of five to six carbon atoms, alkaryl of six to nine carbon atoms, aralkyl of six to nine carbon atoms, phenyl and naphthyl, and monohydroxy-substituted alkyl radicals of no more then eight carbon atoms ; the



radical in which R''' is independently selected from the group consisting of the hydrogen atom and alkyl radicals containing from one to four inclusive carbon atoms and *m* is an integer having a value of 2 or 3; the $-CH_2-_3NR''''_2$ radical in which each R'''' is selected from the group consisting of the hydrogen atom and monovalent hydrocarbon radicals free of aliphatic unsaturation and containing no more than eight carbon atoms and the $-ONR''''_2$ radical in which R'''' is as defined above; and R_1 is independently selected from the group consisting of the methyl radical and R radicals.

3,890,335

5-(3-PYRIDYL)-2-FURALDEHYDE AND PREPARATION

Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Aug. 30, 1973, Ser. No. 392,936

Int. Cl. C07d *31/30*

U.S. Cl. 260—297 R **2 Claims**

1. 5-(3-Pyridyl)-2-furaldehyde.

3,890,336

CERTAIN THIAZOLES CONTAINING PHOSPHORUS ACID ESTERS

Fumio Suzuki; Mamoru Hayashi; Ikuo Kawakami; Fujio Motohashi, and Yoshiki Iwabuchi, all of Tokyo, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

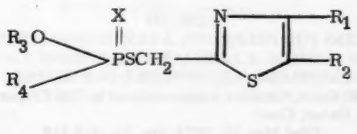
Filed Feb. 28, 1973, Ser. No. 336,834

Claims priority, application Japan, Mar. 17, 1972, 47-27212

Int. Cl. C07d *91/32*

U.S. Cl. 260—302 E **3 Claims**

1. An insecticidal and miticidal compound which comprises



wherein R_1 represents a hydrogen atom or a methyl group, R_2 represents a halogen atom or a nitro group, R_3 represents a methyl or ethyl, R_4 represents a methoxy, ethoxy or phenyl group and X represents a sulfur or oxygen atom.

3,890,337

α,α,α-TRIFLUORO-2-NITRO-6-[OXA(THIO)ZOLYL]THIA-P-TOLUNITRILES

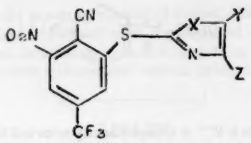
James R. Beck, Indianapolis, and Robert G. Suhr, Greenfield, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 23, 1973, Ser. No. 418,512

Int. Cl. C07d *91/32, 85/44*

U.S. Cl. 260—302 S **7 Claims**

1. A compound of the formula



wherein

X is oxygen or sulfur;

Y and Z, when taken separately, are the same or different, and are hydrogen or phenyl; and

Y and Z, when taken together with the carbon atoms to which they are attached, form a benzene ring or mono halogensubstituted benzene ring.

3,890,338

ETHANOLYSIS OF 3-TRICHLOROMETHYL-5-CHLORO-1,2,4-THIADIZOLE EMPLOYING AQUEOUS BASE

John A. Wojtowicz, Chesire, and Sudhir K. Bhutani, West Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed May 2, 1974, Ser. No. 466,434
Int. Cl. C07d *91/60*
U.S. Cl. 260—302 D **10 Claims**

1. A process for producing 3-trichloromethyl-5-lower alkoxy-1,2,4-thiadiazole comprising:

reacting 3-trichloromethyl-5-chloro-1,2,4-thiadiazole with an aqueous base selected from the group consisting of aqueous alkali metal, alkaline earth metal or ammonium hydroxides, oxides or carbonates and a lower alkanol having 1-4 carbon atoms at a temperature of ambient to 120°C. in a reaction mixture comprising water, 1.01-4 moles of said base and 1-15 moles of said alkanol per mole of 3-trichloromethyl-5-chloro-1,2,4-thiadiazole; thereafter neutralizing said reaction mixture, phasing the neutralized reaction mixture and recovering 3-trichloromethyl-5-lower alkoxy-1,2,4-thiadiazole.

3,890,339

PROCESS FOR PREPARING 3-TRICHLOROMETHYL-5-THOXY-1,2,4-THIADIAZOLE FROM TRICHLOROACETONITRILE IN ETHANOL

David F. Gavin, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed May 28, 1974, Ser. No. 474,118
Int. Cl. C07d *91/60*
U.S. Cl. 260—302 D **1 Claim**

1. A process for preparing 3-trichloromethyl-5-ethoxy-1,2,4-thiadiazole comprising:

1. Reacting trichloroacetonitrile with ammonia in the presence of sufficient ethanol to provide a weight ratio of ethanol to trichloroacetonitrile of 1:1 to 100:1;

2. Adding trichloromethanesulfenyl chloride to the reaction mixture of step 1 in an amount sufficient to produce a trichloromethanesulfenyl chloride/trichloroacetonitrile molar ratio of 1:1 to 10:1 and permitting the reaction to proceed at least until the resulting exotherm has ceased;

3. Thereafter adding a base selected from the group consisting of alkali metal or ammonium hydroxide, carbonate, and bicarbonate to the slurry resulting from step 2, said base being an added in an amount sufficient to provide 3 to 10 equivalents of alkali metal or ammonium ion per mole of trichloroacetonitrile, and thereafter recovering 3-trichloromethyl-5-ethoxy-1,2,4-thiadiazole.

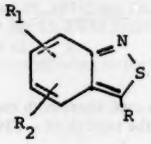
3,890,340

PREPARATION OF 2,1-BENZISOTHIAZOLES

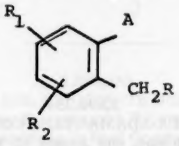
Gary M. Singerman, Prairie Village, Kans., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 19, 1973, Ser. No. 426,064
Int. Cl. C07d *91/12*
U.S. Cl. 260—304 **13 Claims**

1. A method for preparing a 2,1-benzisothiazole having the formula



which comprises reacting a 2-alkylaniline or a 2-alkyl-N-sulfinylaniline having the formula



in which A is amino or N-sulfinylamino and R, R_1 and R_2 are independently hydrogen, alkyl having one to eight carbon atoms, phenyl or phenyl substituted with halogen or lower alkyl having one to four carbon atoms and R_1 and R_2 are additionally independently selected from halogen, nitro, alkoxy having one to eight carbon atoms, chlorocarbonyl, carboalkoxy having one to eight carbon atoms, or dialkylcarbamoyl having one to eight carbon atoms with a sulfinylsulfonamide having the general formula R_3SO_2NSO in which R_3 is alkyl having one to 30 carbon atoms, optionally substituted with halogen, or phenyl, optionally substituted with halogen, alkyl having one to four carbon atoms or nitro at a temperature from about 50° to about 150° C.

3,890,341

METHOD OF PREPARING DI 6-PHENYL-2,3,5,6-TETRAHYDRO-IMIDAZO[2,1-B]THIAZOLE AND ACID ADDITION SALTS THEREOF

John Edson Gordon, Martinsville, and Imre Aurel Halmos, Summit, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed June 18, 1973, Ser. No. 371,229
Int. Cl. C07d *99/10*
U.S. Cl. 260—306.7 T **9 Claims**

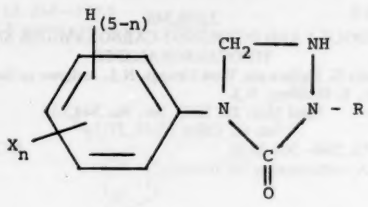
1. A method of preparing dl 6-phenyl-2,3,5,6-tetrahydroimidazo[2,1-b]thiazole, and acid addition salts thereof, comprising (1) reacting dl 3-(β-hydroxyphenethyl)-2-iminothiazolidine, or an acid addition salt thereof, with a highly concentrated aqueous hydrochloric acid containing 36 to 47 percent by weight of hydrogen chloride under conditions so that the said concentration of hydrogen chloride is maintained, at temperatures of about 25°C. to 70°C. to obtain an acid addition salt of dl 3-(β-chlorophenethyl)-2-iminothiazolidine, and (2) heating the latter compound in the presence of an acid binding agent to obtain dl 6-phenyl-2,3,5,6-tetrahydroimidazo[2,1-b]thiazole or (3) treating the latter compound with an anhydrous acid and recovering the dl 6-phenyl-2,3,5,6-tetrahydroimidazo[2,1-b]thiazole acid addition salt.

3,890,342
2-ALKYL-4-ARYL-1,2,4-TRIAZOLIDIN-3-ONES

John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Mar. 28, 1974, Ser. No. 455,710
Int. Cl. C07d 55/06
U.S. Cl. 260—308 C 6 Claims

1. A compound of the formula



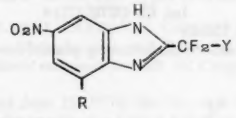
wherein X is selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, halogen, halo lower alkyl and nitro; *n* is an integer from 1 to 3; and R is lower alkyl.

3,890,343
6-NITRO-2-POLYHALOALKYLBENZIMIDAZOLES

John L. Miesel, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 221,808, Jan. 28, 1972, abandoned. This application Mar. 20, 1974, Ser. No. 453,135
Int. Cl. C07d 49/38
U.S. Cl. 260—309.2 7 Claims

1. The compound of the formula



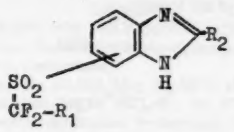
wherein Y represents
a. hydrogen,
b. chlorine,
c. fluorine,
d. difluoromethyl,
e. trifluoromethyl, or
f. pentafluoroethyl;
and R represents
1. Branched alkyl of C_3–C_6, both inclusive,
2. cycloalkyl of C_3–C_6, both inclusive,
3. cycloalkylloweralkyl, wherein cycloalkyl is of C_3–C_6, both inclusive, and loweralkyl is of C_1–C_2, both inclusive, or
4. methylcycloalkyl, wherein cycloalkyl is as defined in the preceding candidate moiety; or an alkali metal or alkaline earth metal salt thereof.

3,890,344
2-HALOALKYL-HALOALKYLSULFONYLBENZIMIDAZOLES

Gerhard Horlein, Frankfurt am Main; Adolf Studeneer, Kelkheim, Taunus; Peter Langeluddeke, Diedenbergen, Taunus, and Friedhelm Schwerdtle, Kelkheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 23, 1974, Ser. No. 472,800
Claims priority, application Germany, May 25, 1973, 2326624
Int. Cl. C07d 49/38
U.S. Cl. 260—309.2 2 Claims

1. A benzimidazole derivative of the formula



I

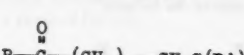
where R_1 is H, $—CF_2H$, —CFClH or $—CCl_2H$ and R_2 is haloalkyl having 1 or 2 carbon atoms.

3,890,345
PREPARATION OF PYRROLINES BY THE AMINATION OF KETONES

Fred L. Metz, Painesville, and James A. Scozzie, Wickliffe, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Feb. 21, 1973, Ser. No. 334,235
Int. Cl. C07d 27/14
U.S. Cl. 260—313.1 8 Claims

1. A process for the production of a substituted pyrroline, which process comprises reacting (A) a ketone having the formula:



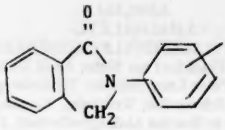
wherein R is a C_1-C_8 aliphatic radical; R′ is H or R; and *n* is 1 or 2, with (B) an excess of NH_3 at a temperature between 400° and 550° C in the presence of a sintered, high porosity, alumina.

3,890,346
PROCESS FOR THE PREPARATION OF N-ARYLPHTHALIMIDINES

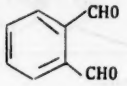
Abul Fateh Mohammed Iobal, Glattbrugg, Switzerland, assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 12, 1973, Ser. No. 340,134
Claims priority, application Switzerland, Mar. 22, 1972, 4213/72
Int. Cl. C07d 27/50
U.S. Cl. 260—325 PH 2 Claims

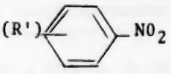
1. A process for the preparation of N-arylphthalimidine of the formula



wherein R′ is a member selected from the group consisting of hydrogen, halogen, methoxy, methyl and phenyl, and which comprises reacting at a temperature of in the range of from about 50° to about 250°C. and under a pressure on in the range of from about 50 to about 300 atmospheres an O-phthlaldehyde of the formula



with an aromatic nitro compound of the formula



wherein R′ is defined as above under carbon monoxide pressure in the presence of pyridine and a catalytic amount of a rhodium carbonyl compound.

3,890,347

ISOINDOLINE DERIVATIVES

David Middlemiss, London, England, assignor to Allen and Hanburys Limited, London, England

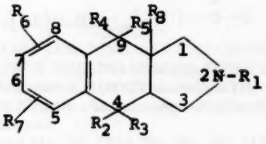
Filed Nov. 24, 1972, Ser. No. 308,958

Claims priority, application United Kingdom, Dec. 8, 1971, 56977/71

Int. Cl.[2] C07D *205/12*

U.S. Cl. 260—326.1 **53 Claims**

1. A compound of the formula



or a non-toxic pharmaceutically acceptable acid addition salt thereof, in which:

R_1 represents hydrogen; alkyl (C_1-D_6); alkenyl (C_2-C_6); alkyl (C_1-C_6) substituted by hydroxy, dialkyl (C_1-C_4) amino, phenyl, benzoly substituted by halo, or phenoxy substituted by (C_1-C_4) alkoxy; or carbamoyl;

R_2 represents hydrogen, hydroxy, (C_1-C_6) alkyl or phenyl, or together with R_4 represents a methylene bridge;

R_3 represents hydrogen, (C_1-C_6) alkyl or phenyl;

R_4 represents hydrogen of hydroxy or together with R_2 a methylene bridge;

R_5 represents hydrogen;

R_6 represents hydrogen, dialkyl (C_1-C_4) amino or nitro;

R_7 represents hydrogen, hydroxy, hydroxyalkyl (C_1-C_4), nitro, (C_1-C_4) alkoxy, acetyloxy, halogen, or a group —NR_9R_{10} in which R_9 represents hydrogen, alkyl (C_1-C_4), acetyl, alkyl (C_1-C_4) sulphonyl or ethoxy carbonyl and R_{10} represents hydrogen, alkyl (C_1-C_4) or hydroxyalkyl (C_1-C_4); and

R_8 represents hydrogen or (C_1-C_6) alkyl.

3,890,348

INDOLE-1 AND INDOLINE-1-CARBOXAMIDES AND THIOCARBOXAMIDES

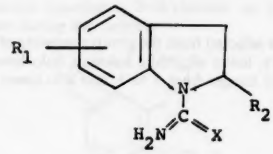
Faizulla G. Kathawala, West Orange, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Mar. 26, 1973, Ser. No. 344,735

Int. Cl. C07d *27/38, 27/56*

U.S. Cl. 260—326.11 R **8 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen, mono- or dialkylamino in which the alkyl group contains 1 to 3 carbon atoms, halo of atomic weight 18 to 80, amino, nitro, alkyl or alkoxy of 1 to 3 carbon atoms or trifluoromethyl,

R_2 is hydrogen or alkyl of 1 to 5 carbon atoms, and

X is sulfur or oxygen.

3,890,349

5,5-DIALKYL-3-PYRROLINE-2,2-DICARBOXYLIC ACID ESTERS

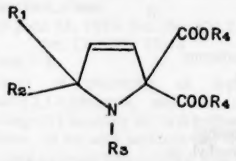
Robert D. Dillard, Zionsville, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 20, 1973, Ser. No. 426,859

Int. Cl. C07d *27/14*

U.S. Cl. 260—326.46 **4 Claims**

1. A compound of the following general formula:



wherein

R_1 and R_2 are independently selected monovalent C_1—C_3 alkyl groups, or R_1 and R_2 taken together constitute a divalent polymethylene group having either four or five carbon atoms which, together with the carbon atom to which it is attached, completes a five- or six-membered carbocyclic ring;

R_3 is a monovalent C_1—C_3 alkyl group; and

R_4 is a monovalent C_1—C_6 alkyl group.

3,890,350

3-AMINO-2-(METHYLENEDIOXYPHENYL)-ACROLEINS

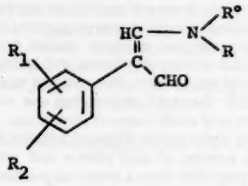
Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 88,221, Nov. 9, 1970, Pat. No. 3,767,650, which is a continuation-in-part of Ser. No. 27,460, April 10, 1970, abandoned. This application Aug. 23, 1973, Ser. No. 390,887

Int. Cl. C07d *13/10*

U.S. Cl. 260—340.5 6 Claims

1. A compound of the formula:



wherein

R_1 and R_2 are on adjacent ring positions and together form methylenedioxy,

R° is alkyl of 1 or 2 carbon atoms,

R is alkyl of 1 or 2 carbon atoms or phenyl, or

R° and R together with the nitrogen to which they are attached form a saturated heterocyclic ring having 5 to 7 ring atoms of which one is the nitrogen atom and the balance are carbon atoms.

3,890,351

LOWERALKYL ESTERS OF 3β-[TRI(LOWER ALKYL)SILYLOXY]-2α-(3-OXO OR HYDROXY-1-OCTENYL)-5-OXO-1β-CYCLOPENTANE-HEPTANOIC ACID, 5-CYCLIC ETHYLENE ACETAL

David Taub, Metuchen, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed May 8, 1972, Ser. No. 251,726

Int. Cl. C07d *13/04*

U.S. Cl. 260—340.9 5 Claims

1. A loweralkyl ester of 3β-2α-(3-oxo-1-octenyl)-5-oxo-1β-cyclopentaneheptanoic acid, 5-cyclic ethylene acetal or a stereoisomer thereof.

3,890,352

DIOXOLANYL CARBONYL CARBOXAMIDES

Eirlys R. Isaac, Sittingbourne, and Peter Kirby, Maidstone, both of England, assignors to Shell Oil Company, Houston, Tex.

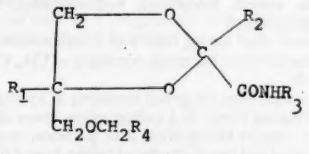
Filed June 25, 1974, Ser. No. 482,933

Claims priority, application United Kingdom, July 3, 1973, 31604/73

Int. Cl. C07c *103/86*

U.S. Cl. 260—340.9 3 Claims

1. An amide derivative of the formula:



wherein R_1 and R_2 each represents an alkyl group of 1–6 carbon atoms, R_3 represents an alkyl-, alkenyl-or aryl-carbonyl group of up to 8 carbon atoms optionally substituted by chlorine, and R_4 represents a phenyl group optionally substituted by fluorine or chlorine or by an alkyl group of 1–6 carbon atoms.

3,890,353

PROCESS FOR PREPARING LACTONES

Joseph J. Becker, Geneva, Switzerland, assignor to Firmenich S.A., Geneva, Switzerland

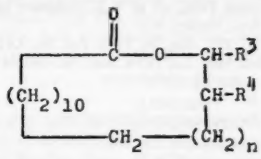
Division of Ser. No. 41,595, May 28, 1970, abandoned. This application July 9, 1973, Ser. No. 377,564

Claims priority, application Switzerland, May 29, 1969, 8192/69; May 27, 1970, 7865/70

Int. Cl. C07d *9/00*

U.S. Cl. 260—343 13 Claims

1. Method for preparation of lactones containing 14 to 17 ring carbon atoms having the formula

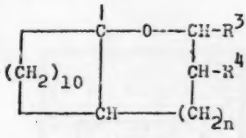


III

wherein R^3 and R^4 represent hydrogen or one of them a methyl radical and the other hydrogen and *n* represents an integer from zero to 3, which comprises cleaving the oxygen to oxygen band by means of a reducing agent of a peroxide having the formula

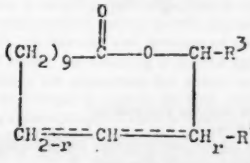
$$R^1\text{-}0\text{-}0\text{-}R^2 \qquad \text{I}$$

wherein R^1 represents hydrogen, a lower hydrocarbon radical selected from alkyl, cycloalkyl, aryl and aralkyl, a lower alkanoyl group or a group of formula



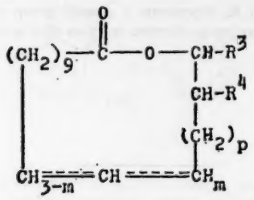
II

and R^2 represents a group of formula II, provided, that when R^1 and R^2 represent a group of formula II they are identical, to give a mixture comprising a lactone of formula III and the corresponding unsaturated lactone having, when n is zero, the formula



IVi

containing one double bond in one of the positions indicated by the dotted lines, and wherein r is zero or 1, or, when n is 1 to 3, the formula



IVii

wherein m is 1 or 2 and p is an integer from zero to 2, and either separating the lactone III from said mixture or hydrogenating the aforesaid mixture or the unsaturated compound IVi, ii, separated from said mixture.

3,890,354

PROCESS FOR PREPARING 3-(3-CYANOPROPYL)-6A-METHYL-4A-HYDROXYPERHYDRO-3H-NAPHTHA[2,1-B]BENZOPYRAN-7-OLS AND 3-(3-CYANOPROPYL)-6A-ETHYL-4A-HYDROXYPERHYDRO-3H-NAPHTHA[2,1-B]BENZOPYRAN-7-ONES AS STEROID INTERMEDIATES

Noal Cohen, Montclair; Michael Rosenberger, Caldwell, and Gabriel Saucy, Essex Fells, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 67,296, Aug. 26, 1970, Pat. No. 3,813,417. This application Mar. 13, 1974, Ser. No. 450,647

Int. Cl. C07d 7/06

U.S. Cl. 260—343.5 **3 Claims**

1. 8-Cyano-5-hydroxyoctanoic acid lactone.

3,890,355

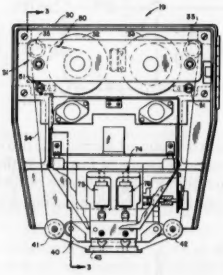
HIGH SPEED COLOR PRINTER FOR SCINTILLATION SCANNER

Carl J. Brunnett, Mayfield Heights; Jeremy H. Gibson, Eastlake; Walter F. Mog, Willowick, and Richard S. Smith, Mentor, all of Ohio, assignors to Picker Corporation, Cleveland, Ohio

Filed June 25, 1971, Ser. No. 156,913

Int. Cl. G01t 1/20

U.S. Cl. 250—366 **42 Claims**



1. A scintillation scanner comprising:

a. a frame structure;

b. a scintillation responsive structure for providing a signal response to radioactivity detected;

c. a drive assembly interposed between said structures for driving said scintillation responsive structure over an area to be studied;

d. media support means carried by one of said structures and adapted to carry a media upon which an image may be printed;

e. color printer means including housing means carried by the other of said structures, said color printer means being electrically coupled to said scintillation responsive structure for printing a composite image on a media which varies in color in accordance with the intensity of radiation sensed by said scintillation responsive structure, said color printer means comprising:

i. an elongate printing ribbon having a plurality of color bands extending longitudinally thereof in side-by-side relation;

ii. ribbon support means carried by said housing means and adapted to support spaced portions of said ribbon;

iii. carriage means movably carried by said housing means and adapted to receive and laterally position a portion of said ribbon intermediate said spaced portions such that said portion has one side positioned adjacent said media support means;

iv. printing stylus means disposed adjacent the other side of said portion of said ribbon and including chisel means extensible from a retracted position to a printing position wherein said chisel means engages said portion of said ribbon and moves said ribbon into engagement with a media carried by said media support means to print an image thereon; and,

v. said carriage means comprising a relatively light mass structure adapted to laterally move only portions of said ribbon which are intermediate said spaced portions in order to selectively align said color bands with said printing stylus means.

3,890,356

7-ALKYL-$\Delta^{3,5}$-STEROIDS

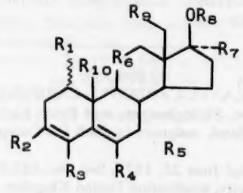
Joyce F. Grunwell, Hamilton; John O. Johnston, Cincinnati; Vladimir Petrow, Cincinnati, and Philip M. Weintraub, Cincinnati, all of Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Mar. 26, 1973, Ser. No. 344,838

Int. Cl.² C07C 167/00, 169/00

U.S. Cl. 260—397.5 **5 Claims**

1. A 7-alkyl-3,5-unsaturated steroid having the general formula:



wherein

R_1, R_3, R_4 and R_{10} are each hydrogen or methyl;

R_2 is selected from the group consisting of hydrogen, chloro, bromo, lower alkyl having from 1 to 4 carbon atoms, phenyl, halophenyl, hydroxyphenyl, tolyl, and methoxyphenyl;

R_5 is lower alkyl having from 1 to 3 carbon atoms;

R_6 is selected from the group consisting of CH_2, CHOH and C = O;

R_7 is selected from the group consisting of hydrogen, lower alkyl having from 1 to 6 carbon atoms, lower alkenyl and lower alkynyl having from 2 to 6 carbon atoms, lower alkenynyl and lower alkadiynyl having from 4 to 6 carbon atoms;

R_8 is selected from the group consisting of hydrogen, acyl having from 2 to 12 carbon atoms, 2-tetrahydropyranyl,

trimethylsilyl, 1-cycloalkenyl having from 5 to 8 carbon atoms, 1-methoxycycloalkyl and 1-ethoxycycloalkyl in which the cycloalkyl group has from 5 to 8 carbon atoms, and the groups R_7 and OR_8 when taken together are oxo or a cyclic acetal; and

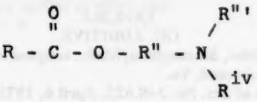
R_9 is hydrogen with the proviso that when R_9 and R_{10} are hydrogen, R_1, R_2, R_3 and R_4 cannot all be hydrogen at the same time.

3,890,357
PROCESS FOR PREPARATION OF AMINOESTERS

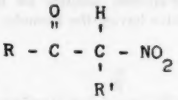
Isaac D. Rubin, Wappingers Falls; Richard F. Love, Fishkill, and Charles B. Holder, Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed July 23, 1973, Ser. No. 382,102
Int. Cl. C07c *69/00*
U.S. Cl. 260—404 **20 Claims**

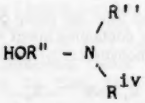
1. The method of preparing an aminoester



which comprises reacting a nitroketone



with a tertiary amino alcohol



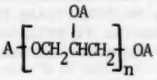
wherein R, R‴, and R^{iv} are saturated hydrocarbon, R′ is hydrogen or saturated hydrocarbon, and R″ is divalent saturated hydrocarbon, thereby forming product aminoester; and recovering said aminoester.

3,890,358
POLYGLYCEROL PARTIAL ESTERS AND THEIR USE IN LIPSTICK FORMULATIONS

Robert B. Hutchison, and Lee R. Mores, both of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

Filed May 8, 1972, Ser. No. 251,367
Int. Cl.² C07C *69/33;* **A61K** *7/027*
U.S. Cl. 260—410.6 **5 Claims**

1. A partial ester of a polyglycerol with a branched chain aliphatic acid having the formula



wherein *n* is an integer from 2 to about 6 and A is a hydrogen or an acyl group of the formula

where R is a branched chain hydrocarbon group having from 13 to 17 carbon atoms, said partial ester having at least 40% of the hydroxyl groups of the polyglycerol unesterified.

3,890,359
COMPLEXES CONTAINING SULPHUR

Grish Chandra, Penarth, Wales, assignor to Dow Corning Limited, Barry Glamorgan, Wales

Filed Jan. 30, 1974, Ser. No. 438,123
Claims priority, application United Kingdom, Feb. 7, 1973, 5962/73
Int. Cl. C07f *15/00*
U.S. Cl. 260—429 R **9 Claims**

1. Rhodium (III) complexes represented by the general formula

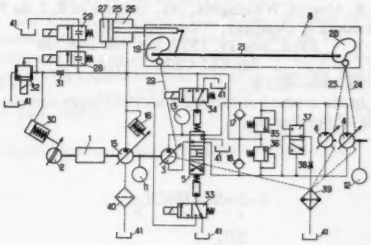
$$RhX_3(SR'R'')_3$$

in which each X is of the group consisting of Cl, Br or I, R′ represents the R_3SiQ— group wherein R is a hydrocarbon radical of the group consisting of alkyl, aryl, aralkyl or alkaryl radical having from 1 to 18 inclusive carbon atoms and Q represents a divalent aliphatic hydrocarbon radical having from 1 to 6 inclusive carbon atoms, and R″ is of the group consisting of alkyl, aryl, aralkyl or alkaryl hydrocarbon radicals having 1 to 18 inclusive carbon atoms or the R_3SiQ— group, wherein R and Q are as defined above.

3,890,360
ENGINE AND TRANSMISSION CONTROL SYSTEM

Francois C. Pruvot, Garches; Roger Maistrelli, Bougival, and Pierre Buachet, Paris, all of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt and Automobiles Peugeot, Paris, both of, France

Filed May 18, 1973, Ser. No. 361,449
Claims priority, application France, June 2, 1972, 72.19933
Int. Cl. F16h *39/50*
U.S. Cl. 60—431 **7 Claims**



1. Apparatus for controlling the transmission ratio and the fuel supply of a propulsive unit of a vehicle including an engine whose torque depends on the fuel supply, a fuel supply control unit, a variable ratio transmission driven by said engine, said transmission having two control inputs controlling, respectively, an increase and decrease of said ratio, operator controlled means for selecting a desired speed (N*b*) of said engine, means for measuring the actual speed (N) of said engine, a dual output governor, the first output of said governor being connected to said control inputs of said transmission and the second output controlling said fuel supply unit, the first output of said governor sending first signal to said input controlling an increase of ratio each time that said selected speed (N*b*) is higher than said actual speed (N) and sending a second signal to said input controlling a decrease of said

ratio each time that said selected speed (N*b*) is lower than said actual speed (N), a function generator which sends by the second output of said governor a third signal for controlling the position of said fuel supply control unit, the magnitude of said third signal depending on the desired torque corresponding to each engine speed as preset in said function generator and said actual engine speed (N), and an amplifier responsive to the difference (N*b*—N) between said actual speed and said selected speed, the output of said amplifier being effective to modify said third signal when said difference is higher than a predetermined value.

3,890,361

PRODUCTION OF GAMMA-BUTYROLACTONE

Junichi Kanetaka; Shoichiro Mori, both of Ami-machi, and Itaru Kobayashi, Tokyo, all of Japan, assignors to Mitsubishi Petrochemical Company, Ltd., Japan

Filed Aug. 30, 1972, Ser. No. 284,988

Claims priority, application Japan, Sept. 25, 1971, 46-74940

Int. Cl. C07d *5/06*

U.S. Cl. 260—343.6 **6 Claims**

1. A process for producing gamma-butyrolactone which comprises the step of causing an aliphatic gamma-dicarboxylic compound selected from the group consisting of succinic acid, succinic anhydride, maleic acid and maleic anhydride to contact hydrogen in the presence of a hydrogenation catalyst consisting essentially of a uniform mixture of (1) nickel, (2) molybdenum, and (3) at least one element selected from the group consisting of barium and thallium, wherein the atomic ratio of molybdenum/nickel is from 0.01 to 0.20, and the atomic ratio of element (3)/nickel is from 0.02 to 0.10,

at a temperature of from 180 to 300°C and a pressure of from 30 to 200 atmospheres.

3,890,362

PREPARATION OF THIOHYDROXIMATE CARBAMATES

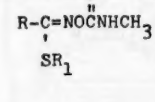
Jose R. Alvarez, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed June 19, 1972, Ser. No. 263,760

Int. Cl.² C07C *119/18*

U.S. Cl. 260—453 R **8 Claims**

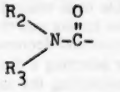
1. In the method of making S-alkyl thiohydroximate carbamates of the formula;



I

wherein

R is methyl, ethyl, or



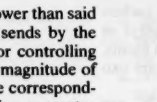
;

R_1 is methyl, ethyl, n-propyl, or isopropyl;

R_2 is hydrogen, methyl, ethyl, n-propyl, or isopropyl; and

R_3 is hydrogen or methyl, provided that when R_2 is ethyl, n-propyl or isopropyl, R_3 is hydrogen;

by reacting methyl isocyanate with an S-alkyl thiohydroximate of the formula:



II

wherein R and R_1 are as defined above, the improvement which comprises carrying out the reaction by adding the methyl isocyanate, in gaseous or liquid form, over a period of time of from 1 to about 12 hours, to an agitated bed of solid particles of the thiohydroximate in the absence of a continuous liquid phase while removing the heat of reaction, the rates of isocyanate addition and heat removal being balanced so as to maintain the temperature of the reaction mass at or above 0°C but below the melting points of the thiohydroximate starting material and the thiohydroximate carbamate product, the mole ratio of said isocyanate to said thiohydroximate being in the range of about 0.95 to about 1.05.

3,890,363

OIL ADDITIVE

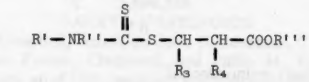
Robert E. Malec, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 348,625, April 6, 1973, Pat. No. 3,833,496. This application May 24, 1974, Ser. No. 473,129

Int. Cl.² C07C *155/04, 155/06, 155/08*

U.S. Cl. 260—455 A **6 Claims**

1. An antiwear-antirust additive for lubricating oils and greases, said additive having the formula:



wherein R′ is selected from the group consisting of aliphatic hydrocarbon radicals containing about 8–100 carbon atoms, and hydrocarbylaminohydrocarbyl radicals having the formula:

$$R_1—NR''''—R_2—$$

wherein R_1 is an aliphatic hydrocarbon radical containing about 8–100 carbon atoms, R′′′′ is selected from the group consisting of hydrogen and C_{1-4} alkyls and R_2 is a divalent aliphatic hydrocarbon radical containing about 2–10 carbon atoms, R_3 and R_4 are selected from the group consisting of hydrogen and alkyl radicals containing about 1–4 carbon atoms, R′′ is selected from the group consisting of hydrogen and C_{1-4} alkyls and R′′′ is selected from the group consisting of hydrogen and salt cations.

3,890,364

α-ARYL-B-(AMINO-PHENYL)ACRYLONITRILES WITH AN O-DIALKYL SULPHAMIDOXY OR SULFURIC ACID SEMI-ESTER GROUP

Hans Knupfer, Berg, Neukirchen, and Carl-Wolfgang Schellhammer, Opladen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

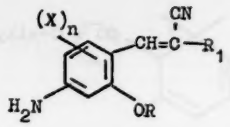
Continuation of Ser. No. 849,867, Aug. 13, 1969, abandoned. This application Dec. 11, 1972, Ser. No. 313,676

Claims priority, application Germany, Aug. 23, 1968, 1793261

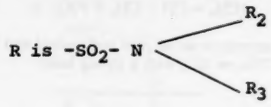
Int. Cl. C07c *121/00, 137/00*

U.S. Cl. 260—456 A **4 Claims**

1. β-phenyl-acrylic acid nitrile or the formula



in which X is H or alkyl or 1–4 carbon atoms;
n is a number of 0 to 3;
R_1 is phenyl; naphthyl; carboxyl; or phenyl substituted with chloro, methyl, methoxy or methyl sulfonyl;



or
$-SO_2Z$;
R_2 and R_3 are methyl or ethyl; and
Z is H, Na or K.

3,890,365

ORGANIC REDUCTION PROCESS

David Colin Jones, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 558,250, June 17, 1966, abandoned. This application Oct. 24, 1972, Ser. No. 299,806

Claims priority, application United Kingdom, June 30, 1965, 22726/65; Aug. 26, 1965, 36683/65; Oct. 17, 1965, 42640/65

Int. Cl. C07c *121/02, 121/26, 121/28*

U.S. Cl. 260—465.8 A **10 Claims**

1. In a process for the reductive dimerization of an α,β-olefinically unsaturated nitrile of ester starting material selected from the group consisting of acrylonitrile, lower alkyl acrylonitrile, lower alkyl acrylates and methylene glutaronitrile to obtain the correspsonding adiponitrile, lower alkyl-substituted adiponitrile, lower alkyl adipate and tetracyanooctane, respectively, therefrom by contacting an alkali metal amalgam at a measured pH of 7 to 11.5 and a temperature favoring dimerization with a liquid reductive dimerization medium containing said starting material and an agent operative with said amalgam to provide said reduction, said agent being selected from the group consisting of water and lower alkanols, the improvement wherein said dimerization medium is free from onium salts and initially consists essentially of a homogeneous solution of the starting material and agent in a liquid non-dimerizable unreactive organic polar amide of the formula $R_1R_2NCOR_3$ where R_1 and R_3 are hydrogen or lower alkyl or are alkyl of not more than 2 carbon atoms joined to form a cyclic amide and the N atom and R_2 is hydrogen or lower alkyl, or mixture of such amide and an inert non-amide polar organic solvent, the nitrile or ester starting material constituting 2 to 40 mole % of said medium, said agent constituting from 1 to 40 mole % of said medium and the balance of said medium consisting essentially of said amide of said mixtures thereof with inert polar organic solvent, with the amide constituting more than 5 mole % of said medium.

3,890,366

α-PHENYL-β,β-PENTAMETHYLENE-GLUTARIC ACID DINITRILES AND PROCESS FOR THEIR PREPARATION

Ernst Ingo Leupold, Hofheim, Taunus, and Hans-Jurgen Arpe, Fischbach, Taunus,, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

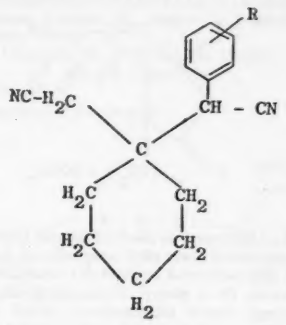
Continuation-in-part of Ser. No. 331,510, Feb. 12, 1973, abandoned. This application Apr. 23, 1973, Ser. No. 353,319

Claims priority, application Germany, Feb. 15, 1972, 2207020

Int. Cl. C07c *121/64*

U.S. Cl. 260—465 F **9 Claims**

1. A compound of the formula



in which R is hydrogen, lower alkyl of up to 4 carbon atoms, alkoxy of up to 4 carbon atoms, or halogen.

3,890,367

3,5-TERT. BUTYL-4-(2,4-DICHLOROPHENYLCARBAMYLOXY) BENZYLIDENEMALONITRILE

Roger Paul Cahoy, Overland Park, Kans., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Division of Ser. No. 190,395, Oct. 18, 1971, Pat. No. 3,825,662. This application May 29, 1973, Ser. No. 364,772

Int. Cl.[2] C07C *121/70*

U.S. Cl. 260—465 D **1 Claim**

1. 3,5-Di-tert.butyl-4-(2,4-dichlorophenylcarbamyloxy)benzylidenemalononitrile.

3,890,368

METHOD FOR N,N-DICYANOETHYLATING AMINOPHENOLS

Norman C. Jamieson, St. Louis, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed June 21, 1973, Ser. No. 372,315

Int. Cl. C07c *121/78*

U.S. Cl. 260—465 E **4 Claims**

1. A method for preparing an N,N-dicyanoethylated aminophenol which comprises heating a mixture consisting essentially of an aminophenol, at least 2 mols of acrylonitrile for each mol of the aminophenol, and glacial acetic acid in an amount at least 50 percent by weight of the aminophenol, at a temperature between about 25°C. and the reflux temperature of the mixture, and thereafter quenching the reaction mixture with water to precipitate a substantially pure dicyanoethylated phenol.

3,890,369
PREPARATION OF OXIMES

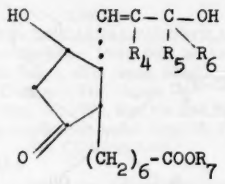
Neville Finch, West Orange, and Isidoros Vlattas, Summit, both of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 311,053, Dec. 1, 1972, which is a continuation-in-part of Ser. No. 241,423, April 5, 1972, Pat. No. 3,798,275. This application Jan. 31, 1973, Ser. No. 328,178

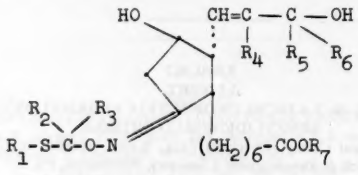
Int. Cl. C07c 61/36, 69/74

U.S. Cl. 260—468 D 8 Claims

1. Process for the preparation of β-hydroxy-ketones corresponding to the formula



in which R_7 is hydrogen, an alkali metal, one equivalent of an alkaline earth metal, lower alkyl, lower alkenyl, lower alkynyl or (3 or 4 ring-membered cycloalkyl, cycloalkenyl or Ph)—C_nH_{2n}, wherein Ph is phenyl, (lower alkyl)-phenyl, (lower alkoxy)-phenyl, (lower alkylenedioxy)-phenyl, (halogeno)-phenyl, (trifluoromethyl)-phenyl, (nitro)-phenyl or (di-lower alkylamino)-phenyl, and *n* is an integer from 0 to 4, each of R_4 and R_5 are hydrogen or lower alkyl, and R_6 is lower alkyl, wherein a compound of the formula



wherein R_1 is lower alkyl, lower alkenyl, lower alkynyl or (3 to 4 ring-membered cycloalkyl, cycloalkenyl, or Ph)—C_nH_{2n}, wherein Ph and n have the meaning given above, R_2 is hydrogen, lower alkyl or said Ph and R_3 is hydrogen or lower alkyl or $R_2 + R_3$ are lower alkylene, is reacted with a mercuric salt in an aqueous, alcoholic or acidic medium at a pH between about 7 to 2, and hydrolysing the desulfurized intermediate obtained in said alcoholic medium with an acid; or with a base when obtained in said acidic medium, and the presence of a hydroxylamine acceptor.

3,890,370
PROCESS FOR PREPARING 2,6,6-TRIMETHYL 1-ALKOXYCARBONYL-2,4-CYCLOHEXADIENES

George H. Buchi, and Hans Wuest, both of Cambridge, Mass., assignors to Firmenich S.A., Geneva, Switzerland

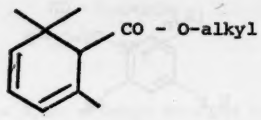
Filed Aug. 16, 1972, Ser. No. 281,220

Claims priority, application Switzerland, Aug. 17, 1971, 12119/71

Int. Cl. C07c 67/06, 69/74

U.S. Cl. 260—468 L 7 Claims

1. Process for the preparation of compounds having the formula



IIIa-1

wherein the alkyl group is a lower alkyl group, which comprises treating a lower alkyl α - isopropylidene acetoacetate in an inert organic solvent with at least one mol per mol of a compound resulting from the reaction of a quaternary phosphonium salt having the formula

$$[CH_2 = CH - CH_2 - PR_3]^+X^- \qquad IV$$

wherein R represents an alkyl or aryl radical and X represents a halogen, ClO_4 or BF_4, with a strong base.

3,890,371
11β-PGE$_2$-TYPE COMPOUNDS

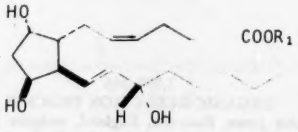
John E. Pike, and William P. Schneider, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 159,478, July 2, 1971, Pat. No. 3,772,350, which is a continuation-in-part of Ser. No. 71,390, Sept. 11, 1970, abandoned. This application Oct. 3, 1973, Ser. No. 403,094

Int. Cl. C07c 61/32, 69/74

U.S. Cl. 260—468 D 3 Claims

1. A compound of the formula



wherein R_1 is hydrogen, alkyl of 1 to 8 carbon atoms, inclusive cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one to 3 chloro or alkyl of 1 to 4 carbon atoms, inclusive, and pharmacologically acceptable salts thereof wherein R_1 is hydrogen.

3,890,372
AMINO SUBSTITUTED PHENYL AND NAPHTHYL ESTERS OF PGF$_2$ α - TYPE COMPOUNDS

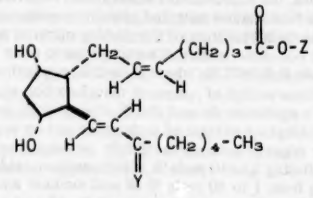
Walter Morozowich, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jan. 8, 1974, Ser. No. 431,758

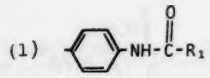
Int. Cl. C07c 69/74, 103/38

U.S. Cl. 260—468 D 6 Claims

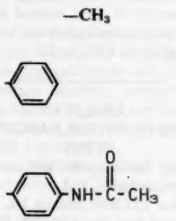
1. An optically active compound of the formula



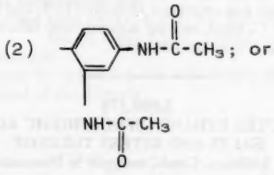
or a racemic compound of that formula and the mirror image thereof, wherein Z is

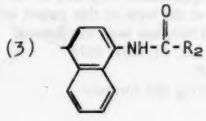


wherein R_1 is



$-NH_2$ or



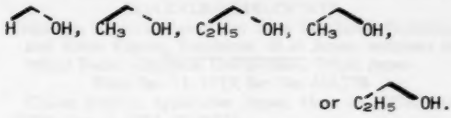


wherein R_2 is

or

$-NH_2$;

and wherein Y is



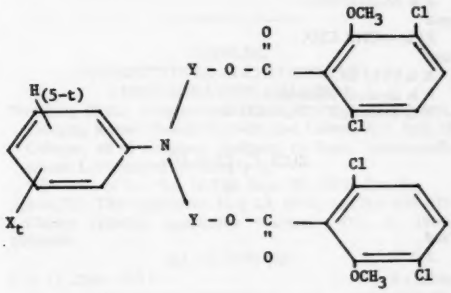
3,890,373

N,N-BIS(2-METHOXY-3,6-DICHLOROBENZOYLOXYALKYL)ANILINES

Takeo Hokama, Chicago, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed July 30, 1973, Ser. No. 383,932
Int. Cl. C07c *93/26*
U.S. Cl. 260—473 R 4 Claims

1. A compound of the formula



wherein X is lower alkyl; t is an integer from 0 to 3; and Y is a straight or branched alkylene chain of from 2 to 3 carbon atoms.

3,890,374

METHOD FOR THE PREPARATION OF MONOMETHYL TEREPHTHALATE OR A MIXTURE THEREOF WITH P-TOULIC ACID

Takao Fujii; Tomio Harada; Koshi Namie, and Shinichi Takeda, all of Matsuyama, Japan, assignors to Teijin Hercules Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 6, 1973, Ser. No. 338,421
Claims priority, application Japan, Mar. 7, 1972, 47-23436
Int. Cl. C07c *69/82*
U.S. Cl. 260—475 R 8 Claims

1. A process for the preparation of monomethyl terephthalate or a mixture thereof with p-toluic acid, which comprises oxidizing methyl p-toluate or a mixture thereof with no more than 80 % by weight of p-xylene by contacting the same with molecular oxygen or a molecular oxygen-containing gas in liquid phase, wherein the oxidation reaction is performed

1. in the presence of a catalyst consisting essentially of
   - A. nickel metal, a nickel compound, or a mixture thereof which is soluble in the reaction system, and
   - B. manganese metal, a manganese compound, or a mixture thereof which is soluble in the reaction system,

   the composition of the catalyst being such that the weight ratio of nickel metal to manganese metal becomes 95:5 to 0.5:99.5 , when components (A) and (B) are respectively converted to nickel metal and manganese metal,
2. at a temperature within the range of 180° to 230°C., and

in the substantial absence of bromine and bromine compound promoters and aliphatic monocarboxylic acid solvents.

3,890,375

HALOGENATED OCTYL ESTERS

Kenneth Rowland Dobson, Epsom Downs, England, assignor to BP Chemicals International Limited, England

Filed Aug. 13, 1973, Ser. No. 387,951

Claims priority, application United Kingdom, Aug. 25, 1972, 39644/72

Int. Cl. C07c *69/80*

U.S. Cl. 260—475 R 3 Claims

1. Esters of linear C_8 alcohols of the general formula

$Z(CH_2)_3.Z^1.CH_2.O.CO.R(Y)_x$ (I)

or $Z(CH_2)_3.CH(Z).O.CO.R(Y)_x$ (II).

wherein

Z is $XCH_2.CHX-$

and

Z^1 is $-CHX.CHX-$

and

X is Cl or Br,

R is divalent phenylene,

Y is $Z(Ch_2)_3.Z^1.CH_2.O.CO$ or

$$Z(CH_2)_3.\underset{Z}{CH}.O.CO.$$

and

x is 1.

3,890,376

PROCESS FOR THE MANUFACTURE OF PERFLUOROALKYL ESTERS

Horst Jager, Bettingen, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

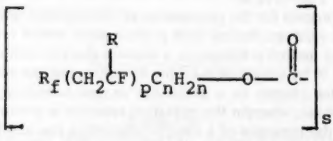
Filed Sept. 10, 1973, Ser. No. 395,810

Claims priority, application Switzerland, Sept. 19, 1972, 13678/72; Dec. 21, 1972, 18660/72

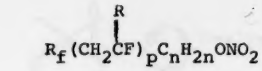
Int. Cl. C07c *69/52, 69/54, 69/60*

U.S. Cl. 260—485 F 21 Claims

1. A process for the manufacture of perfluoroalkyl esters of the formula



wherein R_f represents an unbranched or branched perfluoroalkyl radical with 4 to 14 carbon atoms, R represents hydrogen or fluorine, R_1 represents an ethylenically unsaturated hydrocarbon radical of organic monobasic, dibasic, or tribasic carboxylic acids with 3 to 6 carbon atoms, n is a whole number from 1 to 12, p is 0 or a whole number from 1 to 3, and s is a whole number from 1 to 3, which process comprises reacting at temperatures of from 30° to 150°C a perfluoroalkyl nitrate of the formula



with an organic carboxylic acid of the formula

$R_1(COOH)_s$

in an organic solvent selected from the group consisting of benzene, toluene, xylene, cyclohexane and methylcyclohexane and in the presence of concentrated sulphuric acid, the molar ratio of the perfluoroalkylnitrate to the concentrated sulphuric acid being about 0.01 to 1:1.

3,890,377

3-SUBSTITUTED PHENYLALKANOHYDROXAMIC ACIDS

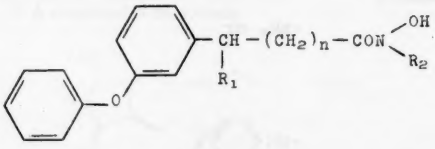
Winston S. Marshall, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 122,999, March 10, 1971, which is a continuation-in-part of Ser. No. 828,756, May 28, 1969, Pat. No. 3,600,437, and a continuation-in-part of Ser. Nos. 823,477, May 9, 1969, abandoned, and Ser. No. 752,801, Aug. 15, 1968, abandoned. This application July 17, 1973, Ser. No. 380,038

Int. Cl. C07c *103/30*

U.S. Cl. 260—500.5 H 2 Claims

1. A compound of the formula



wherein R_1 is hydrogen, C_1 to C_5-alkyl, C_2 to C_5-alkenyl, C_2–C_5-alkynyl; n is an integer of from 0 to 3; and R_2 is hydrogen or C_1 to C_5-alkyl; and the acid addition salts thereof with pharmaceutically acceptable acids.

3,890,378

SUBSTITUTED ETHANE DIPHOSPHONIC ACIDS AND SALTS AND ESTERS THEREOF

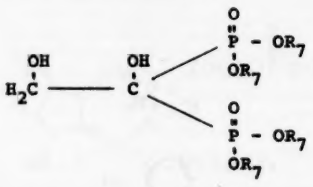
Al F. Kerst, Littleton, Conn., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 27,988, April 13, 1970, Pat. No. 3,705,191. This application Aug. 23, 1972, Ser. No. 283,114The portion of the term of this patent subsequent to Dec. 5, 1989, has been disclaimed.

Int. Cl. C07f *9/38*

U.S. Cl. 260—502.4 P 3 Claims

1. A compound having the formula



wherein each R_7 is individually selected from the group consisting of hydrogen and alkali metal provided at least one R_7 is an alkali metal.

3,890,379

PROCESS FOR THE PREPARATION OF D(−)-2-AMINO-2-(P-HYDROXYPHENYL)-ACETIC ACID

Jozsef Schawartz, Budapest, Hungary, assignor to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara RT, Budapest, Hungary

Filed Aug. 10, 1973, Ser. No. 387,284

Claims priority, application Hungary, Aug. 11, 1972, CI 1262

Int. Cl. C07c *101/06*

U.S. Cl. 260—519 2 Claims

1. A process for the preparation of D-(−)-2-amino-2-(p-hydroxyphenyl)-acetic acid comprising the following steps:

a. reacting 4-hydrobenzaldehyde with an aqueous solution containing sodium bisulfite, ammonium chloride, and ammonium hydroxide to yield a mixture;

b. reacting the mixture formed in step (a) with sodium cyanide to yield a precipitate;

c. extracting the precipitate formed in step (b) with ethyl acetate to produce DL-2-amino-2-(p-hydroxyphenyl)-acetonitrile;

d. reacting L-(+)-tartaric acid with the acetonitrile of step (c) in a reaction medium consisting of benzene, toluene, xylene, ethylacetate, butylacetate, methylethylketone, methybisobutylketone, methanol or ethanol, to crystallize therefrom D-(−)-2-amino-2-(p-hydroxyphenyl)-acetonitrile-L-(+)-hemitartarate;

e. treating the hemitartarate formed in step (d) with hydrochloric acid to form crystals of D-(−)-2-amino-2-(p-hydroxyphenyl)-acetic acid hydrogen chloride; and

f. treating the hydrogen chloride with ammonium hydroxide to precipitate D-(−)-2-amino-2-(p-hydroxyphenyl)-acetic acid.

3,890,380

PROCESS FOR INCREASING THE BULK DENSITY OF SALTS OF 2-(3-PHENOXYPHENYL)PROPIONIC ACID

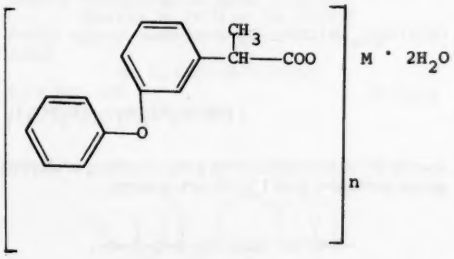
Erwin A. Stephen, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed June 19, 1974, Ser. No. 480,783

Int. Cl. C07c *65/00*, *51/42*

U.S. Cl. 260—520 7 Claims

1. A process for increasing the bulk density of a dihydrate salt compound of the formula



in which M is sodium or calcium, and, when M is sodium, n is 1, and, when M is calcium, n is 2, said compound having a bulk density of less than 0.60 grams per milliliter, which comprises reducing the water content of said compound to less than that represented by a monohydrate form by heating said compound at a temperature form about 40°C to about 200°C., hydrating the compound of reduced water content by contacting said compound with water maintained at a temperature of from about 60°C. to about 90°C., and separating the resulting dihydrate salt compound having a bulk density of at least 0.65 grams per milliliter.

3,890,381

METHOD FOR THE PREPARATION OF DIALKALIOXYDIACETATE

Tadamitsu Kiyoura, Kamakura; Toru Takahashi, Fujisawa, and Yasuo Kogure, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals Incorporated, Tokyo, Japan

Filed Dec. 11, 1973, Ser. No. 423,778

Claims priority, application Japan, Mar. 13, 1973, 48-28595; Apr. 9, 1973, 48-39521

Int. Cl. C07c *51/26*

U.S. Cl. 260—531 C 9 Claims

1. A method for the preparation of a dialkalioxydiacetate consisting essentially of contacting at 20° – 200° C and 1 – 35 atmo. pressure and at a pH of 7 – 14 diethylene glycol with a gas selected from oxygen and air in the presence of water in an amount of at least 5 parts by weight per part of diethylene glycol; an alkaline substance selected from the group consisting of hydroxides, oxides and carbonates of an alkali metal and an alkaline earth metal and ammonium hydroxide and carbonate; and at least a catalyst selected from the group consisting of palladium, platinum, rhodium, ruthenium, rhenium, osmium and iridium and oxides thereof.

3,890,382

N-SUBSTITUTED (2-CHLOROETHYL) PHOSPHORAMIDE CHLORIDE

Wolfgang Hofer, Wuppertal-Wohwinkel; Reinhard Schliebs, Cologne; Robert Rudolf Schmidt, and Ludwig Eue, both of Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

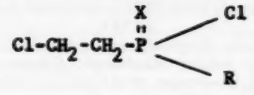
Division of Ser. No. 76,594, Sept. 29, 1970, Pat. No. 3,846,513. This application May 13, 1974, Ser. No. 469,575

Claims priority, application Germany, Oct. 4, 1969, 1950099

Int. Cl. C07f *9/26*

U.S. Cl. 260—543 P 8 Claims

1. A 2-chloroethanephosphonic and 2-chloroethanethionophosphonic acid compound of the general formula



in which

X is oxygen or sulfur;

R is mono-phenylamino or mono-alkylamino of from 1 to 6 carbon atoms.

3,890,383

2-HYDROXY-3,4,5-TRICHLOROBENZENE-SULFONAMIDES

Ralph M. Rodia, and R. Garth Pews, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 77,703, Oct. 2, 1970, Pat. No. 3,803,062. This application May 18, 1973, Ser. No. 361,746

Int. Cl. C07c *143/78*

U.S. Cl. 260—556 AR 1 Claim

1. The compound which is N,N-diethyl-2-hydroxy-3,4,5-trichlorobenzenesulfonamide.

3,890,384

N-[3-(4-METHYL-3-CYCLOHEXENYL)BUTYL]AMINES

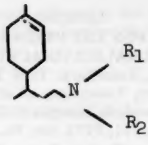
Jerry G. Strong, Fanwood, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 27, 1972, Ser. No. 221,384

Int. Cl. C07c *87/34*

U.S. Cl. 260—563 R 3 Claims

1. A compound having the general formula:



wherein R_1 and R_2 are each selected from the group consisting of hydrogen and alkyl (C_1–C_8).

3,890,385

DICHLOROBENZALDEHYDE-OXIME-CARBONATES

Reinhold Puttner, and Friedrich Arndt, both of Berlin, Germany, assignors to Schering AG, Berlin, Germany

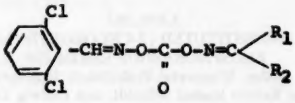
Filed June 28, 1973, Ser. No. 374,496

Claims priority, application Germany, July 13, 1972, 2234816

Int. Cl. C07c *131/00*

U.S. Cl. 260—566 AE **5 Claims**

1. Compounds of the general formula:



wherein R_1 and R_2 are individually selected from the group consisting of an alkyl radical having from 1 to 12 carbon atoms, a cycloalkyl radical having from 5 to 8 carbon atoms, a lower alkoxy radical, a phenyl radical, a naphthyl radical a benzyl radical, a phenylethyl radical, and when taken togeather R_1 and R_2 form a cycloalkyl radical having from 5 to 8 carbon atoms.

3,890,386

N-(TRIHALOMETHYLTHIO-CARBAMIC ACID OXIME ESTER

Engelbert Kuhle, Berg-Gladbach; Erich Klauke, Odenthal-Hahneberg; Brigitte Hamburger, Cologne, and Hans Scheinpflug, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

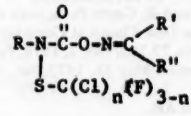
Filed Aug. 29, 1973, Ser. No. 392,832

Claims priority, application Germany, Sept. 6, 1972, 2243626

Int. Cl. C07c *131/00*

U.S. Cl. 260—566 AC **5 Claims**

1. An N-(trihalomethylthio)-carbamic acid oxime ester of the formula



(I)

in which

R is alkyl of up to 4 carbon atoms; phenyl or phenyl carrying at least one halogen, nitro, C_1—C_6 alkoxy radical; R′ and R″ each independently is alkyl of up to 20 carbon atoms; cyclohexyl; phenyl optionally carrying at least one halogen, cyano nitro, trifluoromethyl, C_1—C_6 alkyl or C_1—C_6 alkoxy radical; or

R and R″, conjointly with the carbon atoms that links them, form a cyclopentylidene, cyclohexylidene or norbornylidene radical optionally carrying at least one methyl or cyclohexyl radical; and

3,890,387

3-AMINO-3-METHYL-2-HYDROXY-IMINOBUTAN-1-OL AND SALTS THEREOF

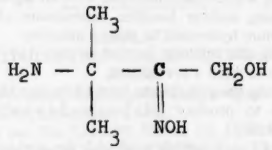
Hamish Christopher Swan Wood, Glasgow, Scotland; Alexander Stuart, Bromley; Adrian Charles Ward Curran, Harrow, both of England, and Saieba Al-hassan, Baghdad, Iraq, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 162,297, July 13, 1971. This application Feb. 19, 1974, Ser. No. 443,503

Int. Cl. C07c *131/00*

U.S. Cl. 260—566 A **4 Claims**

1. A compound



3,890,388

RING CHLORINATION OF ORTHO-TOLUIDINE

Clarence William Schimelpfenig, Wilmington, Del., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.

Filed Mar. 4, 1974, Ser. No. 447,873

Int. Cl. C07c *87/60*

U.S. Cl. 260—578 **3 Claims**

1. A process for making 4-chloro-2-aminotoluene and 6-chloro-2-aminotoluene comprising reacting ortho-toluidine in 90% to 100% concentrated sulfuric acid with at least one mole of chlorine per mole of ortho-toluidine, at a temperature of from 20°C. to 100°C.

3,890,389

PHOSPHATE SALTS OF AMINE BASED POLYOLS

Raymond H. Fowler, Chadds Ford, Pa., assignor to ICI United States Inc., Wilmington, Del.

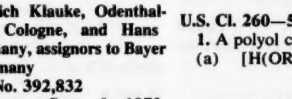
Filed Feb. 23, 1973, Ser. No. 335,369

Int. Cl. C07c *91/02*

U.S. Cl. 260—584 B **7 Claims**

1. A polyol composition represented by the formulas:

(a) $[H(OR')_y]_zNH_{3-z}(H_3PO_4)_n$ and



$$[(OR')_xH]_pH_{1-p}(H_3PO_4)_t$$

wherein R″ is selected from the group consisting of alkylene groups containing from 1 to 20 carbon atoms,

R is independently selected from the group consisting of alkylene groups containing from 1 to 6 carbon atoms, Q is independently selected from the group consisting of hydrogen and $-(OR')_xH$, R′ is independently selected from the group consisting of alkylene groups containing from 2 to 6 carbon atoms, *y* is a number of from 1 to 20, *x* is a number of from 1 to 20, *z* represents a number having an average value of 3 and *m* and *p* are independently selected values of 0 or 1 with the proviso that at least *m* or *p* is 1, *n* has a value of from 0.03 to 0.5, *t* has a value of 0.03 to 1.0 when the amine represented by formula (b) is a diamine and a value of 0.05 to 1.5 and 0.05

to 2.0 when the amine represented by formula (b) is a triamine and tetramine, respectively.

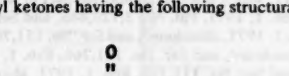
3,890,390

PROCESS FOR THE PRODUCTION OF METHYL KETONES

Nazar S. Aprahamian, deceased, late of West Nyack, N.Y. (Alda Aprahamian, executrix), assignor to Union Carbide Corporation, New York, N.Y.

Filed June 13, 1972, Ser. No. 262,308
Int. Cl. C07c 49/76, 49/06
U.S. Cl. 260—590 13 Claims

1. A non-catalytic vapor phase process for the production of methyl ketones having the following structural formula:



wherein R^1, R^2, R^3, R^4 are hydrogen, a straight or branched chain alkyl radical having 1 to 8 carbon atoms wherein the total number of carbon atoms in all of said alkyl radicals is no greater than 12 carbon atoms, a phenyl radical, or a phenyl radical wherein 1 to 3 hydrogen atoms are substituted by a straight or branched chain alkyl radical having 1 to 3 carbon atoms, and wherein there are no more than 2 phenyl radicals, consisting essentially of admixing acetone with an olefin having the following structural formula:

$$R^1R^2C{=}CR^3R^4$$

wherein R^1, R^2, R^3, and R^4 are as defined above at a temperature in the range of about 300° to about 675°C. wherein the molar ratio of acetone to olefin is in the range of about 0.1 to about 10 mols of acetone per mol of olefin.

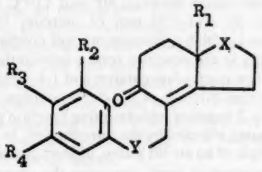
3,890,391

9,10-SECOESTRANE DERIVATIVES AND THEIR PRODUCTION

Ulrich Eder; Gregor Haffer; Jurgen Ruppert; Gerhard Sauer, and Rudolf Wiechert, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

Filed Oct. 24, 1973, Ser. No. 409,235
Claims priority, application Germany, Oct. 25, 1972, 2253089
Int. Cl. C07c 49/76, 49/82
U.S. Cl. 260—590 14 Claims

1. A 9,10-secoestrane formula



wherein R_1 is lower alkyl; R_2, R_3 and R_4 each is a hydrogen atom or alkoxy of 1–4 carbon atoms; X is carbonyl, dialkoxymethylene wherein the alkoxy groups each contain 1–4 carbon atoms, hydroxymethylene, alkoxymethylene wherein the alkoxy group contains 1–10 carbon atoms or aralkoxymethylene wherein the aralkoxy group contains 7–10 carbon atoms; andn Y is carbonyl or dialkoxymethylene.

3,890,392

PREPARATION OF METHYL VINYL KETONE FROM 3-ETOBUTAN-1-OL

George Ember, Hackensack, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed June 25, 1973, Ser. No. 373,071
Int. Cl. C07c 45/16
U.S. Cl. 260—596 10 Claims

1. A process for obtaining methyl vinyl ketone, comprising heating, at a temperature of 100°C. to 300°C. and at a pressure at or above the vapor pressure of the reaction mixture, a solution comprising about 1 to 30 weight percent 3-ketobutan-1-ol, about 0.005 to 0.50 weight percent of sulfuric acid, and about 70 to 99 weight percent of an inert solvent.

3,890,393

2-METHYL-BUTADIENYL-SULPHONES

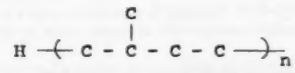
Pierre Chabardes, Rhone; Marc Julia, Paris, and Albert Menet, Rhone, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Apr. 16, 1973, Ser. No. 351,343
Claims priority, application France, Apr. 17, 1972, 72.13433
Int. Cl.[3] C07C 147/04
U.S. Cl. 260—607 R 8 Claims

1. A sulphone of the general formula:

$$Q{-}SO_2{-}CH{=}C(CH_3){-}CH{=}CH_2 \quad (I)$$

in which Q represents a group having a carbon skeleton of formula:



wherein *n* is 1–9, each C_5 unit containing 0–2 ethylenic double bonds, the remaining valencies being satisfied by hydrogen atoms, or two adjacent C_5 units are joined to form a structure containing a ring of 6 ring carbon atoms, which can be substituted by a hydroxy or oxo group, and the chain of C_5 units can have one halogen substituent, with the proviso that Q does not represent a 3-methylbutadienyl radical or a 2-butadienylmethyl radical.

3,890,394

PROCESS FOR MAKING ALPHA-CHLORO SULFIDES

Stephen J. Kuhn, Sarnia, Ontario, Canada, assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 28, 1972, Ser. No. 248,666
Int. Cl. C07c 149/10, 149/30, 69/04
U.S. Cl. 260—609 R 10 Claims

1. The process of making an α-chloro sulfide comprising reacting by contacting the corresponding sulfoxide with a dichloromethyl ether.

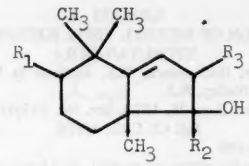
3,890,395

PROCESS FOR THE PHOTOCYCLIZATION OF THE DIHYDRO-IONONES AND THEIR HOMOLOGUES, AND THE PRODUCTS OBTAINABLE BY THIS PROCESS

Oskar Jeger, Zollikerberg; Hans Wolf, and Markus Zink, both of Zurich, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 16, 1972, Ser. No. 298,151
Claims priority, application Switzerland, Oct. 18, 1971, 15162/71; Oct. 18, 1971, 15163/71
Int. Cl. C07c 35/32
U.S. Cl. 260—617 F 4 Claims

1. A compound having the formula



wherein R_1, R_2 and R_3 each independently represent hydrogen or lower alkyl groups.

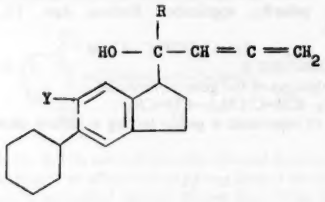
3,890,396

INDANYL BUTADIENOLS

Paul L. Anderson, Dover, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Dec. 28, 1973, Ser. No. 429,390
Int. Cl. C07c *33/02*
U.S. Cl. 260—618 F **4 Claims**

1. A compound of the formula



wherein

R is a hydrogen atom, methyl or ethyl; and

Y is a hydrogen atom or chloro.

3,890,397

PROCESS FOR THE PREPARATION OF 2-NAPHTHOLE FROM THE CORRESPONDING TETRALIN-1-HYDROPEROXIDE AND 1,2-DIALIN

Thomas Charles Rees, Park Forest South, Ill., and Gerald Sugerman, Allendale, N.J., assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Mar. 24, 1972, Ser. No. 237,809
Int. Cl. C07c *37/06*
U.S. Cl. 260—621 H **9 Claims**

1. In a process for the preparation of 2-naphthol or a substituted 2-naphthol from Tetralin-1-hydroperoxide or the corresponding Tetralin-1-hydroperoxide and 1,2-dialin or the corresponding 1,2-dialin, the steps which comprise

a. reacting a Tetralin-1-hydroperoxide selected from the group consisting of Tetralin-1-hydroperoxide and Tetralin-1-hydroperoxide further substituted by a member of the group consisting of lower alkyl, lower alkoxy and halogen and having at least one unsubstituted beta-position with a molar excess of the corresponding 1,2-dialin in the presence of a catalyst selected from the class consisting of the halides, oxides, carbonyls, acetyl acetonates, naphthenates and alkanoates of vanadium, molybdenum, rhenium, tungsten, tantalum and titanium at a temperature of 0° to 150° C. to produce a mixture comprising the corresponding 1,2-dialin oxide, the corresponding 2-tetralone, the corresponding 1-tetralone and the corresponding 1-tetralol;

b. adding an acidic or basic catalyst selected from the group consisting of mineral acids, alkanoic acids, alkyl sulfonic acids, inorganic bases and alkali and alkaline earth alkoxides to catalytically rearrange said corresponding 1,2-dialin oxide to a mixture of the corresponding tetralones predominating in the corresponding 2-tetralone;

c. separately securing by distillation of the resulting reaction mixture (b) said corresponding unreacted 1,2-dialin, said corresponding 2-tetralone, and a remainder comprising said corresponding 1-tetralone and said corresponding 1-tetralol, and

d. dehydrogenating said corresponding 2-tetralone to the corresponding 2-naphthol by liquid or vapor phase contact at temperatures up to 500° C. with a palladium, platinium, or nickel dehydrogenation catalyst.

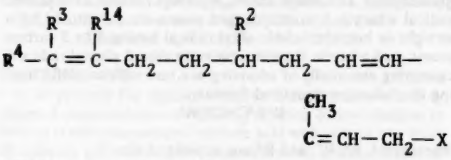
3,890,398

ALIPHATIC TRI-OLEFINIC HALIDES

Clive A. Henrick, and John B. Siddall, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 187,897, Oct. 8, 1971, Pat. No. 3,755,411, which is a continuation-in-part of Ser. Nos. 111,650, Feb. 1, 1971, Pat. No. 3,729,486, and Ser. No. 111,702, Feb. 1, 1971, abandoned, and Ser. No. 111,765, Feb. 1, 1971, abandoned, and Ser. No. 111,766, Feb. 1, 1971, abandoned, and Ser. No. 111,770, Feb. 1, 1971, abandoned, and Ser. No. 115,725, Feb. 16, 1971, Pat. No. 3,706,733. This application Jan. 14, 1972, Ser. No. 217,930
Int. Cl. C07c *21/18*
U.S. Cl. 260—653.3 **7 Claims**

1. A compound selected from those of the following formula:



wherein,

X is bromo, chloro, fluoro or iodo;

each of R^2, R^3 and R^4 is methyl or ethyl; and

R^{14} is hydrogen or methyl.

3,890,399

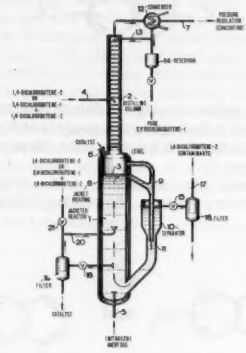
PROCESS FOR THE CONTINUOUS MANUFACTURE OF 3,4-DICHLOROBUTENE-1

Klaus Gehrmann, Knapsack; Alexander Ohorodnik, Erftstadt-Liblar; Odo Dettmeier, Okriftel, and Heinz-Josef Berns, Berrenrath, all of Germany, assignors to Hoechst Aktiengesellschaft, Knapsack near Cologne, Germany

Filed Sept. 5, 1972, Ser. No. 286,292
Claims priority, application Germany, Sept. 6, 1971, 2144475
Int. Cl. C07c *21/04*
U.S. Cl. 260—654 R **3 Claims**

1. A process for isomerizing 1,4-dichlorobutene-2 in a reaction zone in contact with a catalyst containing copper-I-chloride on a carrier material in a fluidized bed in liquid phase at boiling temperatures between 80° and 110°C under pressures between 50 and 150 mm of mercury to give 3,4-dichlorobutene-1, which process comprises continuously conveying upwardly in the reaction zone a substantially uniform suspension of fine particulate catalyst and 1,4-dichlorobutene-2 or a commercial mixture of 3,4-dichlorobutene-1 and 1,4-dichlorobutene-2 together with resulting reaction product, the upward flow being effected by the introduction, in accordance with the principle of an air-lift pump, of inert gas into, near the bottom of, the reaction zone, removing the suspension from the top of the reaction zone and then recycling downwardly the suspension through a conduit to the bottom of the reaction zone; the recycled suspension passing through an injector system situated in said conduit in a closed catalyst separating zone containing recycle liquid consisting of 1,4-dichlorobutene-2, higher boiling contaminants and small quantities of 3,4-dichlorobutene-1, the injector system providing for a suction intake into said conduit; distilling off 3,4-

dichlorobutene-1 near the head of the reaction zone; conveying the 3,4-dichlorobutene-1 to a distilling zone and fractionating it therein until pure; condensing the pure 3,4-dichlorobutene-1 in a cooling zone; following establishment of the reaction equilibrium, continuously supplying starting material to the reaction zone and/or to the center portion of the distilling zone and continuously removing catalyst-free recycle liquid near the head of the catalyst separating zone; flowing



the recycle liquid, which is to be removed from the catalyst separating zone, downwardly through an injector in said zone and then upwardly through said catalyst separating zone on the outside of said injector towards a recycle liquid outlet near the head of said catalyst separating zone at a velocity smaller than the sedimentation velocity of the catalyst in the catalyst separating zone whereby the amount of catalyst removed with the recycle liquid is minimized.

3,890,400
PROCESS FOR SELECTIVELY HYDROGENATING CYCLIC OLIGOMERS OF BUTADIENE

Yvon Lagrange, La Garenne Colombes; Germain Martino, Poissy, and Christian Lassau, Chavenay, all of France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants, Rueil Malmaison, France

Filed Feb. 21, 1973, Ser. No. 334,454

Claims priority, application France, Feb. 24, 1972, 72.06406

Int. Cl. C07c *5/02*

U.S. Cl. 260—666 A **9 Claims**

1. A process for selectively and catalytically hydrogenating in liquid phase an unsaturated cyclic oligomer of butadiene selected from the group consisting of 1,5-cyclooctadiene and 1,5,9-cyclododecatriene, which comprises reacting said unsaturated oligomer with hydrogen at a temperature of from 60° to 250°C, in contact with a catalytic quantity of a reaction mixture produced by the single step of reacting at 0°–250°C:

a. an iron compound selected from the group consisting of iron halide, iron alcoholate and an iron salt of a carboxylic acid of 1–20 carbon atoms,

b. an organometallic reducing compound of the formula $MR_1R_2R_3$ in which M is aluminum or boron and each of R_1, R_2 and R_3 is a hydrogen atom or a monovalent hydrocarbon radical, and

c. a phosphine of the formulae $PR_4R_5R_6$ or $(R)_2P\text{-}A\text{-}P(R)_2$ wherein R_4R_5 and R_6 are monovalent hydrocarbon radicals, R is a monovalent hydrocarbon radical of 1–20 carbon atoms, and A is a direct bond or a divalent hydrocarbon radical of 1–6 carbon atoms.

3,890,401
METHOD OF PREPARATION OF ETHYLCYCLOHEXANE

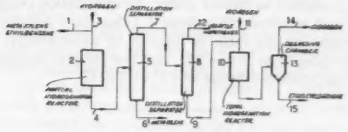
Michele Giangaspero, Monfalcone; Giorgio Tlustos, Marino Bose, and Domenico Corsi, Trieste, all of Italy, assignors to Aquila S.p.A., Trieste, Italy

Filed Dec. 27, 1973, Ser. No. 428,768

Claims priority, application Italy, Dec. 12, 1972, 33794/72

Int. Cl. C07c *5/10, 7/00*

U.S. Cl. 260—667 **16 Claims**



1. A method for the preparation of ethylcyclohexane from an initial mixture of ethylbenzene and meta-xylene, said method comprising

effecting partial catalytic hydrogenation of said initial mixture to obtain a conversion of ethylbenzene in said mixture to ethylcyclohexane of between 50 to 99% and conversion of meta-xylene in said mixture between 10 and 50%.

separating by distillation in two steps ethylcyclohexane and non-hydrogenated ethylbenzene from the partially hydrogenated mixture, the first of said steps comprising separating from the hydrogenate the non-hydrogenated meta-xylene and the second of said steps comprising separating a fraction containing ethylcyclohexane and non-hydrogenated ethylbenzene from the remainder of the hydrogenate, and

effecting total catalytic hydrogenation of said fraction containing ethylcyclohexane and non-hydrogenated ethylbenzene.

3,890,402
OLIGOMERIZATION PROCESS

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

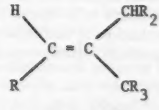
Continuation-in-part of Ser. No. 405,524, Oct. 11, 1973, abandoned. This application Mar. 15, 1974, Ser. No. 451,475

Int. Cl. C07c *3/18*

U.S. Cl. 260—668 F **6 Claims**

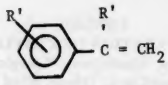
1. A process for the oligomerization of a monoalkenyl compound selected from the group consisting of

A. compounds having from 4 to 20 carbon atoms per molecule characterized by the formula



wherein each R is independently selected from the group consisting of hydrogen, alkyl, cycloalkyl and aryl; and

B. compounds having from 8 to 20 carbon atoms per molecule characterized by the formula



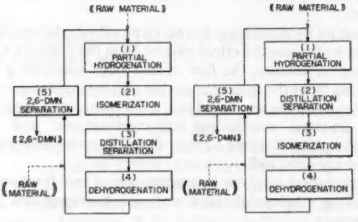
wherein each R' is independently selected from the group consisting of hydrogen, alkyl and cycloalkyl; which comprises contacting said monoalkenyl compound with a catalytic amount of elemental iodine in the presence of tetrahydrothiophene-1,1-dioxide as diluent under oligomerization conditions wherein said tetrahydrothiophene-1,1-dioxide is present in an approximate weight ratio of diluent to monoalkenyl compound ranging from 5:1 to 1:5, and the process temperature is in the approximate range of 25° to 250°C.

3,890,403

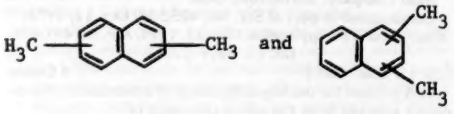
PROCESS FOR SEPARATING AND RECOVERING 2,6-DIMETHYLNATHTHALENES

Keizo Shimada; Takeo Nishikawa; Toshiaki Harada, and Shizuo Nagahama, all of Tokyo, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Nov. 14, 1973, Ser. No. 415,646
Int. Cl. C07c 7/02
U.S. Cl. 260—674 N 8 Claims



1. A process for separating and recovering 2,6-dimethylnaphthalene from a dimethylnaphthalene mixture containing

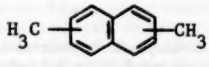


which comprises the steps of:

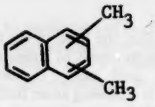
i. partially hydrogenating the above dimethylnaphthalene mixture to a dimethyltetralin mixture,

ii. subjecting said mixture to an isomerization reaction,

iii. after said isomerization of said dimethyltetralin mixture separating the partially hydrogenated dimethyltetralins (I) of said

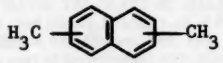


from partially hydrogenated dimethyltetralins (II) of said



and collecting dimethyltetralins (I),

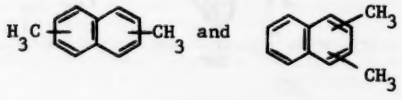
iv. dehydrogenating said dimethyltetralins (I) to be



and

v. separating and recovering 2,6-dimethylnaphthalene from the resultant dehydrogenation product and recycling the residual dimethylnaphthalenes to the above partial hydrogenation step (i).

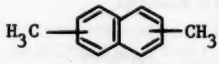
8. A process for separating and recovering 2,6-dimethylnaphthalene from a dimethylnaphthalene mixture containing



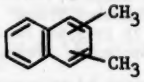
which comprises the steps of:

i. partially hydrogenating the above dimethylnaphthalene mixture to a dimethyltetralin mixture,

ii. separating the partially hydrogenated dimethyltetralins (I) of said



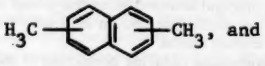
from partially hydrogenated dimethyltetralins (II) of said



and collecting dimethyltetralins (I),

iii. subjecting said dimethyltetralins (I) to an isomerization reaction,

iv. dehydrogenating said dimethyltetralins (I) to



and,

v. separating and recovering 2,6-dimethylnaphthalene from the resultant dehydrogenation product and recycling the residual dimethylnaphthalenes to the above partial hydrogenation step (i).

3,890,404

METHOD FOR PRODUCING ISOPRENE

Kazumi Takagi, and Teruo Matsuda, both of Niihama, Japan, assignors to Sumitomo Chemical Co., Ltd., Japan

Continuation-in-part of Ser. No. 79,700, Oct. 9, 1970, abandoned. This application Feb. 8, 1973, Ser. No. 330,687
Claims priority, application Japan, Oct. 9, 1969, 44-80884; Jan. 20, 1970, 45-5572; Feb. 6, 1970, 45-10929
Int. Cl. C07c *1/24*
U.S. Cl. 260—681 28 Claims

1. A method for producing isoprene which comprises reacting isobutene with a reactant selected from the group consisting of formaldehyde, isoprene glycol and an ester of isoprene glycol and an acid at a molar ratio of isobutene to reactant of 1:1 to 10:1 in an aqueous solvent system comprising water or a mixture of water with t-butanol in the liquid phase in contact with a catalyst selected from the group consisting of aluminum chloride, ferrous chloride, ferric chloride, chromic chloride, cobaltous chloride, cobaltic chloride, nickelic chloride, cuprous chloride, manganese chloride, cadmium chloride, ferrous sulfate, ferric sulfate, aluminum sulfate, chromic phosphate and chromous phosphate at a temperature of from 110°C to 180°C and under autogenetic pressure, the concentration of the catalyst being from about 1 to 5% by weight on the basis of the total weight of the reaction mixture.

3,890,405

POLYALPHAMETHYLSTYRENE-POLYDIMETHYLSILOXANE BLOCK COPOLYMERS SUITABLE AS BLOWN FILMS

Thomas C. Kendrick, and Andrew H. Ward, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed July 26, 1973, Ser. No. 383,014
Int. Cl. C08f *33/08*; C08g *31/09*
U.S. Cl. 260—827 2 Claims

1. A block copolymer suitable for making blown films consisting essentially of polyalphamethylstyrene blocks bonded at each terminal end to polystyrene blocks and in turn the polystyrene blocks are bonded to polydimethylsiloxane blocks, each repeating block unit of one polyalphamethylstyrene block and two polystyrene blocks having a molecular weight of at least 2,000 but less than 7,000 and the total molecular weight of said block copolymer being from 30,000 to less than 500,000 and there being an average of at least 3-polyalphamethylstyrene blocks and at least 4 polydimethylsiloxane blocks per molecule in said block copolymer, said block copolymers being terminated with polydimethylsiloxane blocks wherein the end blocking groups are hydroxyl groups or trimethylsiloxy groups, wherein the combined weight of the polyalphamethylstyrene and polystyrene in the block copolymer is from 15 to 60 weight percent based on the total weight of the block copolymer and the amount of the polydimethylsiloxane is from 40 to 85 weight percent based on the total weight of the block copolymer, said polystyrene blocks being present in an amount to provide no more than 18 weight percent based on the combined weight of the polyalphamethylstyrene and polystyrene present, said block copolymers have a melt flow index greater than 1.0 as determined by the procedure of ASTM:D-1238-L.

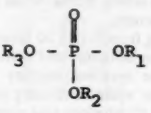
3,890,406

MODIFIED POLYPHENYLENE OXIDES CONTAINING PHOSPHORIC ACID ESTER-ANTIMONY TRIOXIDE FLAME RETARDING ADDITIVES

Hiroomi Matsunaga, Ashiya; Takuzo Okumura, Toyonaka; Isao Takata, Takatsuki, and Teruo Saito, Osaka, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Sept. 8, 1972, Ser. No. 287,559
Claims priority, application Japan, Sept. 9, 1971, 46-70021; July 26, 1972, 47-75423
Int. Cl. C08f *29/12*, *29/30*, *15/00*
U.S. Cl. 260—874 8 Claims

1. A flame-retarded composition of a modified polyphenylene oxide comprising 100 parts by weight of a modified polyphenylene oxide obtained by graft polymerizing in a dispersed state a styrene monomer in the presence of a polyphenylene oxide with a rubbery polymer, 0.5–10 parts by weight of at least one phosphoric acid ester having a boiling point of 200°C or higher, of the formula,



wherein R_1, R_2 and R_3 are individually an aliphatic or aromatic hydrocarbon group having 2 to 20 carbon atoms, and 0.2–5 parts by weight of antimony trioxide.

3,890,407

NOVEL ADHESIVE COMPOSITIONS

Paul Clayton Briggs, Jr., Wilmington, and Lawrence Carl Muschiatti, Newark, both of Del., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 273,353, July 20, 1972, abandoned. This application May 4, 1973, Ser. No. 357,387
Int. Cl. C08f *15/00*
U.S. Cl. 260—878 R 12 Claims

1. An adhesive composition consisting essentially of a solution having a Brookfield viscosity of up to about 1 million, of a sulfur-bearing composition selected from chlorosulfonated polyethylene and a mixture of sulfonyl chloride with chlorinated polyethylene in at least one polymerizable vinyl monomer and an accelerator; said sulfur-bearing composition containing about 25–70 wt. percent of chlorine and about 3–160 mmoles sulfonyl chloride moiety per 100 g of polymer and being made from polyethylene having a melt index of about 4-500.

3,890,408

PROCESS FOR PREPARING BLOCK COPOLYMERS

Herman A. J. Schepers, Stein, and Bernard C. Roest, Geleen, both of Netherlands, assignors to Stamicarbon, N.V., Geleen, Netherlands

Filed June 30, 1972, Ser. No. 268,173
Claims priority, application Netherlands, July 2, 1971, 7109142
Int. Cl. C08f *19/08*, *15/18*
U.S. Cl. 260—879 9 Claims

1. Process for preparing an elastomeric block copolymer having the general configuration

A—B—C

wherein A is a non-elastomeric polymer block formed from a 1-alkyl-ethylene-carboxylic acid ester derived from a 1-alkyl-ethylene carboxylic acid of 4–10 carbon atoms and wherein the alkyl group has 1–4 carbon atoms or a monoalkene aromatic compound having a number average molecular weight between about 200 and 100,000 and a glass transition point above about 25° C, B is an elastomeric conjugated diene polymer block having a number average molecular weight

between about 25,000 and 1,000,000 and a glass transition point below about 0° C, C is a polymer block having a number average molecular weight between about 200 and 100,000 and a glass transition point above about 200 and 100,000 and a glass transition point above 50° C formed from a 1-alkyl-ethylene carboxylic acid ester derived from a 1-alkyl-ethylene carboxylic acid of 4–10 carbon atoms and wherein the alkyl group has 1–4 carbon atoms; said process comprising the sequential copolymerization steps of:

1. polymerizing a monomer or monomer mixture with the aid of a monofunctional lithium-based anionic initiator to form said first non-elastomer polymer block A;
2. adding a conjugated diene monomer to the reaction mixture containing said block A while continuing said polymerization under such conditions to form the said elastomeric polymer block B on non-elastomeric polymer block A;
3. adding to the reaction mixture

$$CH_2{=}C\ R_1R_2$$

wherein R_1 and R_2 independently represent an aryl group having 6–18 carbon atoms or an aralkyl group having 6–18 carbon atoms,

the amount being from 0.1 to 10 times the molar amount of the said anionic initiator, and thereafter

4. adding to the reaction mixture said 1-alkyl-ethylene carboxylic ester while continuing polymerization to form terminal block C, whereby said elastomeric block copolymer A—B—C is formed.

3,890,409

DICYCLIC DIPHOSPHATES AND DIPHOSPHITES

Horst Mayerhoefer, Oberwil/Basel-Land; Wolfgang Mueller Neuallschwil/Basel-Land, all of; Urs Soliberger, Fullinsdorf/Basel-Land, and Rainer Wolf, Allschwil/Basel-Land, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

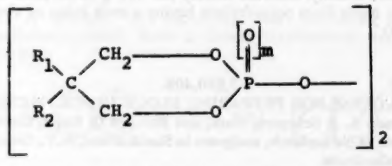
Filed May 29, 1973, Ser. No. 364,629

Claims priority, application Switzerland, June 1, 1972, 8117/72; June 14, 1972, 8898/72

Int. Cl. C07d *105/04;* **C08f** *45/58*

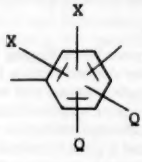
U.S. Cl. 260—927 R **12 Claims**

1. A compound of the formula



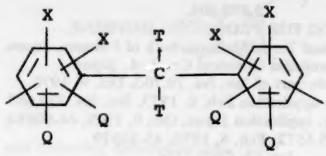
wherein R_1 and R_2 are each, independently, hydrogen or alkyl of 1 to 5 carbon atoms,

Y is a radical Y_3,



Y_3

or a radical Y_4,



Y_4

each X is, independently, chlorine or bromine,

each Q is, independently, hydrogen, methyl, chlorine or bromine, and

each T is, independently, hydrogen or alkyl of 1 to 4 carbon atoms,

and m is zero or the integer 1,

with the proviso that when m is zero, at least one Q of Y_3 is chlorine or bromine.

3,890,410

SUBSTITUTED TRITHIOPHOSPHONATES

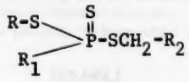
Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 284,005, Aug. 28, 1972, abandoned, which is a continuation-in-part of Ser. No. 184,244, Sept. 27, 1971, abandoned. This application Mar. 25, 1974, Ser. No. 454,191

Int. Cl. C07f *9/40;* **A01n** *9/36*

U.S. Cl. 260—956 **7 Claims**

1. A compound having the formula



in which R is lower alkyl, R_1 is lower alkyl and R_2 is alkynyl containing at least one acetylenic triple bond and containing from 2 to 4 carbon atoms, inclusive.

3,890,411

PROCESS FOR FORMING PHOSPHORUS CONTAINING POLYMERS

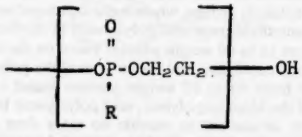
Kyung Sup Shim, Irvington, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 14, 1974, Ser. No. 442,569

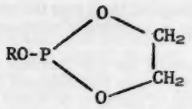
Int. Cl. C07f *9/40*

U.S. Cl. 260—969 **9 Claims**

1. A process for forming a polymer having a repeating unit of the formula

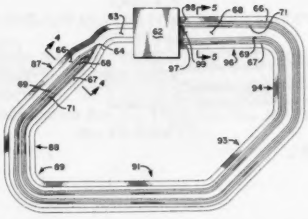


where R is selected from the group consisting of methyl and ethyl which comprises the heating of a phosphorane compound of the formula



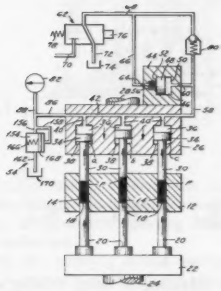
where R has the same meaning set forth above, to a temperature of 100°C to 250°C in the presence of a catalytically effective amount of a lower alkylene glycol and a halide rearrangement catalyst.

3,890,412
LIQUID COOLING ASSEMBLIES
Leonard J. Boler, Minneapolis, Minn., assignor to Cherne Industrial, Inc., Edina, Minn.
Filed Oct. 10, 1972, Ser. No. 296,779
Int. Cl. B01f *3/04*
U.S. Cl. 261—90 **9 Claims**



1. A large scale liquid cooling assembly comprising a plurality of liquid cooling spray units, each of which has a plurality of liquid spray members adapted for controlled projection of liquid drops in trajectories, substantially all of which have horizontal components extending in one common horizontal direction from the spray members of that particular spray unit, with drop sizes, velocities and volume rates of liquid spraying adapted to provide a directional wind effect across said unit along said one horizontal direction, said assembly having said spray units located and arranged in at least first and second row portions with a plurality of spray units in each row portion, the spray units in the first row portion being aligned and oriented to project liquid drops in a first horizontal direction across a reservoir portion adjacent said first row portion, and the spray units in the second row portion being aligned and oriented to project liquid drops in a second horizontal direction across a reservoir portion adjacent the second row portion, said first and second horizontal directions being angularly oriented with respect to each other, said assembly of spray units and row and reservoir portions having said spray units located and arranged in first and second spaced generally parallel rows with a plurality of cooling units in each row, and having an inner reservoir portion between said rows, a first outer reservoir portion outside the first row, and a second outer reservoir portion outside the second row, the spray units in the first row being aligned and oriented to project liquid drops in one horizontal direction across one of the reservoir portions, and the spray units in the second row being aligned and oriented to project liquid drops in the opposite horizontal direction.

3,890,413
APPARATUS AND METHOD FOR COMPACTING PARTICULATE MATERIALS
William M. Peterson, Troy, Mich., assignor to Hydramet American Inc., Royal Oak, Mich.
Filed Aug. 15, 1974, Ser. No. 497,573
Int. Cl. B30b *11/02*
U.S. Cl. 264—40 **14 Claims**



11. The method of compacting powder in a plurality of open ended die cavities to simultaneously form a plurality of compacted pellets by applying opposed forces to two sets of axially opposed punches extending into the cavities of a die from the opposite ends thereof, at least one set of said punches being mounted on a head, said head and die being relatively movable, each punch of one set being operably connected with an individual piston movable axially within a hydraulic cylinder on said head, said cylinders being in common fluid communication, which comprises, applying a force to produce relative movement of said head and die so that each punch on the head approaches the adjacent end of the powder column in its respective cavity while the punches of the other set are positioned to engage the opposite ends of the powder columns; permitting each piston to retract slightly in its respective cylinder in response to its respective punch encountering the resistance of the adjacent end of the powder column by displacing hydraulic fluid from each cylinder into an expandable fluid chamber connected in closed circuit with said cylinders; causing said chamber to expand so as to receive said fluid from said cylinders; while continuing the application of said force, arresting expansion of said chamber before any of said retracting pistons bottom in their respective cylinders to thereby apply substantially equal relatively low pressures on all of said pistons; increasing said force to continue the relative movement of the head and die until the fluid pressure in said cylinders rises to a predetermined high value which corresponds to the desired compacting force exerted by the punches on the columns of powder to thereby form said pellets, said fluid being compressible responsive to pressure at said high value; relieving said force to reduce the pressure in said cylinders to a positive value sufficiently below said high pressure to thereby permit substantial decompression of said fluid so that the expansion thereof causes the pistons to advance relative to their cylinders; retaining both sets of punches in pressure contact with the opposite ends of the pellets by the application of a differential force thereto to cause the punches to move in the same direction relative to the die to eject the pellets axially from the cavities; and thereafter moving one set of said punches relative to the other to permit extraction of the pellets from therebetween.

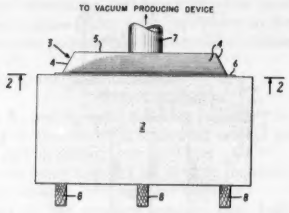
3,890,414
RAPID COOLING PROCESS FOR IMPROVING QUALITY OF POLYURETHANE FOAM

Michael Anthony Ricciardi, 100 Woodlawn Dr., Conyngham, Pa. 18219; David J. Smudin, 849 Davidson Rd., Piscataway, N.J. 08854; Richard D. Wagner, 1007 Seybert St.; Michael Pcolinsky, 8½ E. Diamond Ave., both of Hazelton, Pa. 18201, and John Edward Chaya, 638 North St., West Hazelton, Pa. 18201

Continuation-in-part of Ser. No. 117,356, Feb. 22, 1971, abandoned. This application Mar. 19, 1973, Ser. No. 340,981

Int. Cl. B29d *27/03*

U.S. Cl. 264—45.1 **17 Claims**



1. A process for preparing an open, cellular, solid polyurethane mass having more uniform physical properties throughout the cross-section of the mass, which comprises inducing a pressure drop across at least two opposing gas-permeable surfaces of a hot, freshly-polymerized, open-celled, solid polyurethane bun to induce a draft of gas having an initial temperature of about 80°F or lower to pass through the bun between the two surfaces in order to cool the bun rapidly and uniformly.

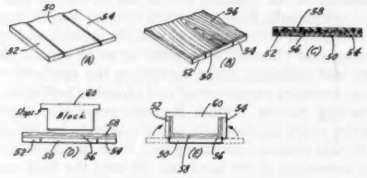
3,890,415
BOX BEAM FABRICATION PROCESS

Otis E. Hull, Oxnard, Calif., assignor to Hexcel Corporation, Dublin, Calif.

Continuation of Ser. No. 194,751, Nov. 1, 1971, abandoned, which is a continuation-in-part of Ser. No. 885,038, Dec. 15, 1968, abandoned. This application Mar. 7, 1974, Ser. No. 449,173

Int. Cl. C08g *27/00*

U.S. Cl. 264—46.7 **7 Claims**



1. A process for forming a plurality of beams, each beam being defined by a bottom and a pair of spaced and parallel sidewalls, the process comprising:

a. providing a form having a central elongated base member and an elongated side member hinged to each longitudinal side of the base member;

b. providing a reusable, flat, flexible rubber-like mold liner having a grain surface simulating a wood grain;

c. placing the liner flat on a surface of the form to cover the base member and the side members with the grain surface of the liner facing upwardly;

d. spreading a layer of uncured polyurethane foam plastic over the grain surface of the mold liner while the liner is flat;

e. placing an elongated block over the layer of plastic on the base member in coextensive relationship with the base member;

f. thereafter turning the side members up relative to the base member towards the elongated block to cause the liner and layer of plastic to be folded against the block;

g. permitting the plastic to set;

h. thereafter removing the liner from the set plastic; and

i. thereafter repeating steps (c) through (h) by using the liner previously removed from the set plastic.

3,890,416
METHOD FOR PRODUCING A CAVITY OR A ZONE OF VERY LOW DENSITY IN THE INTERIOR OF EXTRUDED PROFILES OF FOAMABLE THERMOPLASTICS

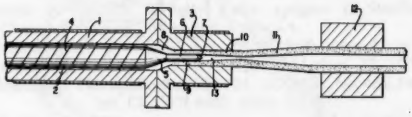
Johann Bauer, Burghausen, and Hansjochen Barth, Emmerting, both of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed May 4, 1973, Ser. No. 357,251

Claims priority, application Germany, May 5, 1972, 2222194

Int. Cl. C08g *27/00*; B29f *3/00*

U.S. Cl. 264—45.5 **2 Claims**



1. A process for the production of a cavity or a zone of very low density in the interior of an extruded profile of a foamable thermoplastic which consists of extruding a foamable thermoplastic through a narrow annular orifice flow channel containing no restriction within said narrow annular orifice, the outer surface of said flow channel being defined by the length of an extruder head, the inner surface of said narrow annular orifice flow channel comprising a rotating cylinder having a conical tip extending in the direction of extrusion flow, wherein said rotating cylinder extends further into said flow channel of said extruder head than the dimension of the outside diameter of said rotating cylinder, foaming said foamable thermoplastic and recovering a foamed thermoplastic having a cavity or a zone of very low density in the interior of its profile.

3,890,417
POROUS DIAPHRAGMS

Christopher Vallance, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jan. 24, 1973, Ser. No. 326,475

Claims priority, application United Kingdom, Feb. 4, 1972, 5351/72

Int. Cl. C08f *47/08*

U.S. Cl. 264—49 **28 Claims**

1. A method of manufacturing a porous diaphragm suitable for use in electrolytic cells comprising preparing an aqueous dispersion of polytetrafluoroethylene and a solid particulate removable filler, thickening said aqueous dispersion to effect agglomeration of the solid particules therein, forming from the thickened dispersion a dough-like material containing water as lubricant for a subsequent sheet forming operation, calendering said dough-like material to form a biaxially fibrillated sheet and removing the solid particulate filler from the sheet to render it porous.

3,890,418
SKINNING PROCESS FOR EXPANSION CASTING OF POLYMERIC FOAMS

Thaddeus A. Raczek, Apalachin, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 212,653, Dec. 27, 1971, abandoned. This application Jan. 30, 1974, Ser. No. 438,100
Int. Cl. B29d 27/04; B29h 7/20
U.S. Cl. 264—54 6 Claims

1. A process for expansion casting a polymeric foam object having a skinned smooth surface which comprises:

placing a highly gas permeable membrane sheet on the surface of a mold cavity;

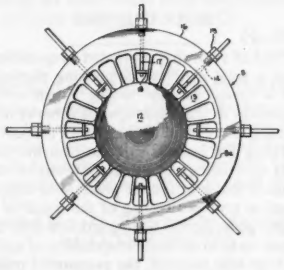
placing an ABS thermoplastic foam material into the mold until the mold is filled, said foam material containing a heat-sensitive, chemical blowing agent which when exposed to heat emits an inert gas which causes said material to expand to the contour of the mold cavity; and

heating said mold to a temperature sufficient to activate said blowing agent and cause expansion of said material, the blowing agent gas and any air in said cavity permeating through said sheet to produce a smooth skin on the surface of the foam material adjacent the sheet with no adherence between said sheet and the foam material.

3,890,419
METHOD AND APPARATUS FOR PRODUCING STRIPED SOAP BAR

Thaddeus John Kaniecki, Pompton Plains, N.J., assignor to Armour-Dial, Inc., Phoenix, Ariz.

Continuation of Ser. No. 111,443, Feb. 1, 1971, abandoned. This application July 11, 1973, Ser. No. 368,761
Int. Cl. B29f 3/12
U.S. Cl. 264—171 6 Claims

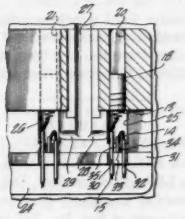


1. In a method for producing a multi-colored detergent bar which includes pressing and passing a detergent material in a circular motion through a final plodding stage in which said material is passed forwardly through a cylindrical channel in said plodding stage by screw action to knead said material, then passing said material through a plurality of separate ducts contained in a plate between said plodding area and a conical area and into said conical area, and compacting said material in said conical area, the improvement which comprises introducing coloring matter in a confined stream into said material from an injection tube and directing said stream from a stationary orifice in said tube with said tube being located within one of said ducts in the direction in which the detergent material is being passed through said duct, the area of said confined stream being small as compared to the area of said duct, whereby to produce an extruded bar having a stripe therein.

3,890,420
METHOD OF MAKING A BIPOLAR ELECTRODE STRUCTURE

Theodore C. Neward, 521 Scripps, Claremont, Calif. 91711

Filed June 4, 1973, Ser. No. 366,701
Int. Cl. B29f 1/10
U.S. Cl. 264—261 3 Claims



1. A method of making an electrode structure including a helically coiled sharpened prong electrode and a conductor, the electrode and conductor having attached portions, the method characterized by:

a. screwing the helically coiled electrode into a helical groove in a spindle to secure the electrode thereto;

b. placing the spindle into a recess confronting a mold cavity to effect insolation of the coiled electrode from the mold cavity;

c. positioning the attached portions of the electrodes and conductor in the mold cavity;

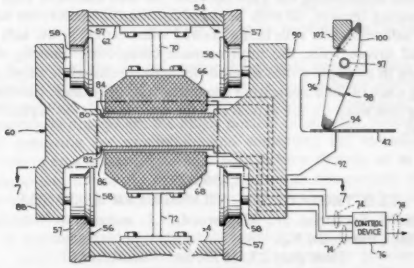
d. extending the remaining of the conductor through an opening communicating with the mold cavity to isolate the remaining portion of the conductor from the mold cavity; and

e. injecting a mold material into the mold cavity to form a part encompassing the attached portions of the electrode and conductor.

3,890,421
METHOD FOR BIAXIALLY DRAWING PLASTIC FILMS

Fortune Habozit, Lyon, France, assignor to La Cellophane, Paris, France

Filed Aug. 1, 1972, Ser. No. 276,951
Claims priority, application France, Aug. 5, 1971, 71.28731
Int. Cl. B29d 7/24
U.S. Cl. 264—289 4 Claims



3. A method of drawing a plastic film continuously as the film is advanced longitudinally, comprising the steps of:

grasping sequentially successive portions of the film along opposite edges of the film with opposed pairs of clamps mounted on carriages, wherein the carriages each incorporate an armature of a linear motor;

uniformly exciting successive field windings of a stationary element of the linear motor with which the armatures are associated to advance the carriages at a constant speed

along parallel paths and thereby advance the film longitudinally;

heating the film as the film advances longitudinally;

exciting successive downstream field windings with progressively more energy than adjacent upstream field windings to accelerate the downstream carriages while diverging the paths over which the pairs of clamps advance to draw the film longitudinally while drawing the film laterally; and

exciting successive field windings uniformly while advancing the pairs of clamps at a constant speed along parallel paths extending from the diverging paths and heat-setting the drawn film as the drawn film advances.

3,890,422

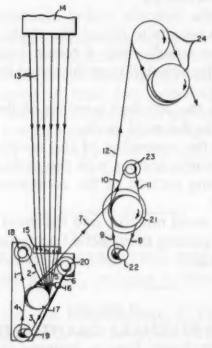
METHOD OF DRAWING YARN USING A PLURALITY OF SEPARATOR ROLLS WITH EACH DRIVEN ROLL

Richard Donnan Livingston, Seaford, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 387,049, Aug. 9, 1973, abandoned. This application Apr. 26, 1974, Ser. No. 464,368

Int. Cl. B29c *17/02*

U.S. Cl. 264—290 R **3 Claims**



1. In a method for drawing synthetic yarn that includes passing substantially undrawn yarn in multiple spaced surface wraps around a driven feed roll and a plurality of associated separator rolls, then passing the yarn in multiple spaced wraps around a driven draw roll and its associated separator rolls while maintaining the yarn between the feed and draw rolls at drawing tension, all rolls being of constant diameter, the axis of said separator rolls being skewed with respect to the axis of said driven rolls, the improvement comprising: passing the yarn in multiple wraps around the driven rolls while contacting each of their associated separator rolls only once, therebeing one wrap on the driven roll for each associated separator roll.

3,890,423

ELECTROACOUSTIC TRANSDUCER ASSEMBLY

Ellis M. Zacharias, Jr., Ridgewood, N.J., assignor to Nusonics, Inc., Paramus, N.J.

Filed July 27, 1973, Ser. No. 383,406

Int. Cl. H04r *17/00*

U.S. Cl. 310—8.3 **6 Claims**

1. An electroacoustic transducer assembly comprising:

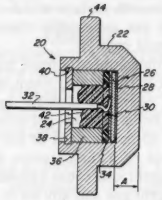
a disk shaped, electroacoustic ceramic transducer having a first face and a second face opposite the first face and a first electrode and a second electrode affixed to the first and the second opposite faces thereof, respectively;

a housing formed of a block of material of low acoustic attenuation and distortion and having a cavity therein to receive the transducer;

a nonconductive liquid free of dissolved and entrained air forming a thin film interface between the first electrode and the housing;

holding means for holding the transducer in position such that the said first electrode is in intimate contact with the housing comprising:

an O-ring in contact with the second face of the transducer;



a sleeve in contact with the O-ring; and

retaining means in contact with the sleeve to thereby hold the O-ring in compression and force the first electrode on the first face of the transducer into contact with the housing;

electrical contacting means connected to the second electrode; and

restraining means for holding the electrical contacting means to prevent excessive motion thereof.

3,890,424

METHODS OF TREATING SOLID SUBSTANCES WITH A VAPOR

Timothy Alan Davies, Weymouth, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Nov. 8, 1971, Ser. No. 196,761

Claims priority, application United Kingdom, Nov. 20, 1970, 55422/70

Int. Cl. C01g *43/02*

U.S. Cl. 423—19 **5 Claims**

1. A method of removing unwanted evaporable solid substances from a solid material, comprising placing said solid material in a closed furnace having a pair of oppositely-disposed openings so that said material is between said openings, connecting one of said openings with a vessel containing liquid, operating the furnace so as to heat the material and continuously evacuating the furnace by way of the other of said openings in order to reduce pressure in said liquid containing vessel to promote boiling of the liquid in said vessel whereby vapor generated by boiling is drawn over the material in said furnace so as to facilitate evaporation of said unwanted substances from said material, the evaporated material being removed through said other opening.

3,890,425

REDOX TREATMENT OF ALUNITE ORE

Douglas Stevens, Golden, Colo.; Helge O. Forberg, Owensboro, Ky.; Larry D. Jennings, Arvada, Colo.; Frank M. Stephens, Jr., Lakewood, Colo.; Francis J. Bowen, Golden, Colo.; David L. Thompson, and Julian V. Copenhaver, Jr., both of Arvada, Colo., assignors to Southwire Company, Carrollton, Ga.; National Steel Corporation, Pittsburgh, Pa. and Earth Sciences, Inc., Golden, Colo.

Filed Mar. 21, 1974, Ser. No. 453,234

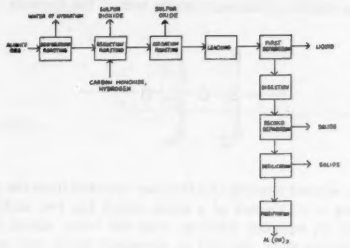
Int. Cl. C01f *7/06, 7/02*

U.S. Cl. 423—127 **15 Claims**

1. A method for recovering aluminum hydroxide and other valuable constituents from ore containing alunite, comprising the steps of:

a. roasting the ore to remove water of hydration,

b. roasting the dehydrated ore resulting from Step (a) in a reducing atmosphere to remove sulfate,
c. roasting the reduced ore resulting from Step (b) in an oxidizing atmosphere to convert sulfides to sulfur oxides,
d. leaching the oxidized ore resulting from Step (c) with solvent to remove potassium and sulfate,
e. separating the liquid and solid portions of the slurry resulting from Step (d),
f. digesting the solid portion resulting from Step (e) with an aqueous mixture of alkali metal hydroxides at a concentration and at a temperature sufficient to extract the aluminum content from said solid portion,



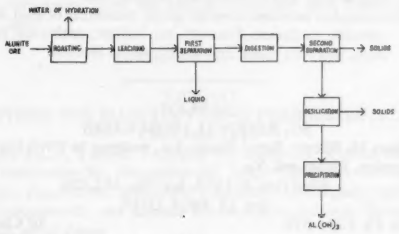
g. separating the liquid and solid portions of the digestion mixture resulting from Step (f),
h. precipitating silica from the liquid portion resulting from Step (g),
i. separating the supernatant from the precipitant resulting from Step (h),
j. precipitating aluminum hydroxide from the supernatant resulting from Step (i) and
k. separating the supernatant from the precipitated aluminum hydroxide resulting from Step (j).

3,890,426

METHOD OF TREATING ALUNITE ORE

Douglas Stevens, Golden, Colo.; Helge O. Forberg, Owensboro, Ky.; Larry D. Jennings, Arvada, Colo.; Frank M. Stephens, Jr., Lakewood, Colo., and Francis J. Bowen, Golden, Colo., assignors to Southwire Company, Carrollton, Ga.; National Steel Corporation, Pittsburgh, Pa. and Earth Sciences, Inc., Golden, Colo.

Filed Mar. 21, 1974, Ser. No. 453,225
Int. Cl. C01f *7/02, 7/06*
U.S. Cl. 423—127 **21 Claims**



1. A method for recovering aluminum hydroxide from ore containing alunite comprising the steps of:
a. roasting the ore to remove the water of hydration,
b. leaching the roasted ore from Step (a) with a weak base at a pH of from about **8** to about **12** to dissolve sulfate and alkali metals,
c. separating the liquid and solid portions of the slurry resulting from Step (b), said liquid portion containing dissolved sulfate and alkali metals,
d. digesting the solid portion from Step (c) with an aqueous mixture of alkali metal hydroxides at a concentration and at a temperature sufficient to extract the aluminum content from said solid portion,
e. separating the liquid and solid portions of the slurry resulting from Step (d),
f. precipitating silica from the liquid portion resulting from Step (e),
g. separating the liquid and solid portions resulting from Step (f),
h. precipitating aluminum hydroxide from the liquid portion resulting from Step (g),
i. separating the aluminum hydroxide precipitate from the liquid portion resulting from Step (h).

3,890,427

RECOVERY OF GALLIUM

John L. Dewey, Little Rock; George W. Cook, Benton, and Charles E. Scott, Little Rock, all of Ark., assignors to Reynolds Metals Company, Richmond, Va.

Filed Mar. 28, 1974, Ser. No. 455,519
Int. Cl. C01g *15/00*
U.S. Cl. 423—129 **8 Claims**

1. A process for treating solutions containing gallium in admixture with aluminum and caustic in order to enhance the gallium concentration which comprises:
a. adding a source of silica sufficient to react with 50–98 percent by weight of the total soda present in said solution in an amount so as to provide 2 moles of silica per mole of soda to be reacted;
b. adding a source of alumina if the $Na_2O : Al_2O_3$ ratio of the solution is above about 1 to lower the ratio to about 1 or lower;
c. heating the solution at temperatures of from about 212° to about 400° so as to cause alumina and caustic to selectively react with the silica to form a precipitate and leave the substantial portion of the gallium in solution;
d. separating the precipitate from the solution; and
e. evaporating the solution so as to increase the gallium concentration thereof.

4. In a process for enhancing the gallium concentration of a solution containing caustic, alumina and gallium wherein said solution is treated with carbon dioxide at conditions to selectively precipitate the major portion of alumina, followed by removing the precipitate and subjecting the remaining solution to a second treatment with carbon dioxide so as to precipitate a mixture of sodium aluminum compounds and sodium gallium compounds, the improvement which comprises
a. calcining said precipitate of aluminum and gallium compound and dissolving the same in water to provide a solution having a $Na_2O: Al_2O_3$ ratio of about 1;
b. contacting said solution from step (a) with silica in an amount equal to about 2 moles silica per mole of alumina to be reacted at elevated temperatures of from about 212° to about 400°F so as to cause the silica to selectively react with caustic and aluminum and form a precipitate and leave the substantial portion of gallium in solution;
c. separating said gallium solution from said precipitate; and
d. concentrating said gallium solution by removal of water.

3,890,428
DECOLORIZATION OF AMMONIUM THIOSULFATE

Madhusudan D. Jayawant, Hockessin, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

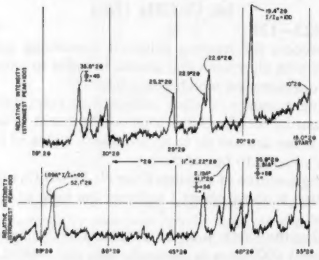
Filed Sept. 6, 1973, Ser. No. 394,821
Int. Cl. C01b *17/64*
U.S. Cl. 423—264 6 Claims

1. A method for removing coloring agents selected from the group consisting of iron compounds, sulfide ions and polysulfide ions from aqueous ammonium thiosulfate solutions comprising (a) adding to such solution a decolorizing amount of SiO_2 as aqueous sodium, potassium or lithium silicate to precipitate such coloring agents and (b) separating the precipitated coloring agents from the aqueous solutions.

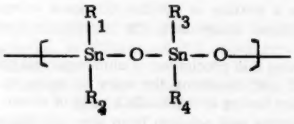
3,890,429
INORGANIC STANNIC OXIDE POLYMERS AND METHOD FOR THE PREPARATION THEREOF

Louis L. Pytlewski, Philadelphia, Pa., assignor to Research Corporation, New York, N.Y.

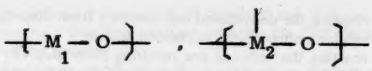
Continuation-in-part of Ser. No. 71,426, Sept. 11, 1970, Pat. No. 3,676,186, which is a continuation-in-part of Ser. No. 591,717, Nov. 5, 1966, abandoned. This application Oct. 22, 1971, Ser. No. 191,865
Int. Cl. C01b *21/48*; C01g *19/02*, *19/04*
U.S. Cl. 423—395 10 Claims



1. An inorganic hydrophilic polymer consisting essentially of (a) a major portion of first monomeric units of the formula

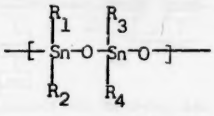


wherein at least one of the groups $R_1 - R_4$ is a member selected from the group consisting of —OH and —O—and at least one of the groups $R_1 - R_4$ is an anion of a water soluble salt of tin, the remainder of the groups $R_1 - R_4$ being members selected from the group consisting of —OH, —O— and an anion as defined above and (b) a minor portion of a second monomeric unit selected from the group consisting of



and mixtures thereof wherein M_1 is a divalent metal ion and M_2 is a trivalent metal ion of a metal having two stable states of oxidation in an aqueous medium said minor portions being effective to impart colloidal properties to said polymer when dispersed in water.

4. A process for the manufacture of the polymer according to claim 1 consisting essentially of the steps of adding to water a first amount of a water soluble stannic salt which is hydrolizable to a stannic oxide monomeric unit of the formula



adding a second amount of a reactant selected from the group consisting of (1) a salt of a metal which has two stable valences in an aqueous solution, said salt being added in the lower valence state, and (2) an elemental metal, said second amount being an effective amount sufficient to react with said first amount of said stannic salt to provide said colloidally dispersible positively charged, hydrophilic polymer and heating the resulting aqueous mixture to an elevated temperature less than the boiling point of the mixture until a color change occurs in said mixture.

3,890,430
METHOD OF PRODUCING DIAMOND MATERIALS

Valentin Nikolaevich Bakul, ulitsa Kirova, 34a, kv.12; Alexandr Alexandrovich Shulzhenko, ulitsa Novo-Konstantinovskaya, 17, kv.27, and Anatoly Fedorovich Getman, ulitsa Syretskaya, 38, kv.2, all of Kiev, U.S.S.R.

Continuation of Ser. No. 259,804, June 5, 1972, abandoned. This application Jan. 28, 1974, Ser. No. 437,380
Claims priority, application U.S.S.R., Jan. 13, 1972, 1732201
Int. Cl. C01b *31/06*
U.S. Cl. 423—446 3 Claims

1. In a method for the synthesis of diamond from a reaction mixture consisting of a carbonaceous material and a carbon solvent under a pressure of at least 60 kbar and at a temperature of at least 1,700°C within the range of diamond stability, the improvement consisting in that the carbon solvent consists of:

a. a member selected from the group consisting of zinc, magnesium and combination thereof, and
b. a member selected from the group consisting of lead, lead selenide, cadmium, bismuth, tin, indium, antimony, thallium, mercury oxide and conbinations thereof.

3,890,431
SO_2 REMOVAL FROM GASES

Sidney M. Blitzer, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

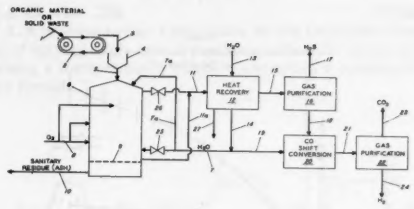
Filed Oct. 4, 1973, Ser. No. 403,420
Int. Cl. B01d *53/34*
U.S. Cl. 423—575 10 Claims

8. A process for removing SO_2 from a gaseous stream containing SO_2 which comprises bringing said stream into contact with an aqueous solution of carboxymethoxysuccinic acid or a water soluble salt thereof whereby SO_2 is removed from said stream forming a complex containing SO_2 and carboxymethoxysuccinic acid or the salt thereof.

3,890,432
CATALYTIC HYDROGEN MANUFACTURE

Robert J. White, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 34,834, May 5, 1970, Pat. No. 3,759,677. This application Feb. 5, 1973, Ser. No. 329,471
portion of the term of this patent subsequent to July 9, 1991
Int. Cl. C01b *1/02, 1/32, 2/06*
U.S. Cl. 423—655 2 Claims



1. A process for converting solid organic waste containing at least 10 weight percent oxygen and less than 5 weight percent sulfur to a synthesis gas and a sanitary inorganic residue and for separating gases obtained during the conversion of the solid waste into valuable gas streams which comprises:

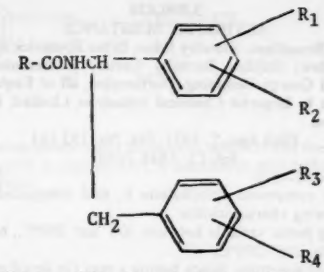
a. reacting the solid waste with steam in a reaction zone at a temperature between 500° and 3000°F. to generate a hydrogen-rich gas containing hydrogen, hydrogen sulfide, carbon monoxide, and carbon dioxide, said reaction being catalyzed by the presence in the solid feed of potassium carbonate or sodium carbonate, based on the amount of the solid organic waste material feed, in the range of from about 1 to 50 weight percent,
b. withdrawing the hydrogen-rich gas from the reaction zone at a temperature between 500° and 3000°F.,
c. recovering heat from the hydrogen-rich gas by heat exchanging the hydrogen-rich gas with H_2O to obtain steam,
d. using at least a portion of the steam generated in step (c) as feed steam for reaction with the solid municipal waste according to step (a),
e. separating H_2S from hydrogen-rich gas withdrawn from heat recovery step (c),
f. shift converting carbon monoxide present in hydrogen-rich gas withdrawn from the H_2S separation step to obtain additional hydrogen and carbon dioxide, and
g. separating carbon dioxide from the hydrogen-rich gas withdrawn from the carbon monoxide shift conversion step.

3,890,433
METHOD FOR MANUFACTURING PHARMACEUTICAL PREPARATION

Ryota Oishi, Yamato 1-chome, Takatsuki-shi; Yotaka Mito, Otoshimoto-cho, Neyagawa-shi; Kenji Yamauchi, Kuwatacho, Ibaraki-shi; Katsuyuki Takahashi, Sonehigashi-machi, Touonaka-shi, and Kazushi Hirata, Ooike 2-chome, Ibaraki-shi, all of Japan

Filed Oct. 4, 1972, Ser. No. 294,949
Claims priority, application Japan, Oct. 4, 1971, 46-78058
Int. Cl. A61k *9/00*
U.S. Cl. 424—37 16 Claims

1. A method for manufacturing a pharmaceutical preparation of an amide compound of the following formula:



wherein R is a straight or branched, saturated or unsaturated hydrocarbon group having 17 to 25 carbon atoms, unsubstituted or substituted with hydroxyl, and wherein R_1, R_2, R_3 and R_4 are each a hydrogen atom, a halogen atom, a lower alkyl group or a lower alkoxy group, provided that R_1, R_2, R_3 and R_4 are not simultaneously all hydrogen atoms, said amide being either a paste, a semisolid or a wax-like solid with a melting point of from 50°C. to 84.5°C. at ambient temperature, the resulting preparation being highly stable to air oxidation, easily administrable through an intestinal route and exhibiting a high pharmacological activity, which comprises the steps of:

1. melting said amide compound at 110°C. to 120°C. in the presence of about 0.2 to 0.5 percent by weight, on the basis of the amount of amide compound, of at least one oil-soluble antioxidizing agent;
2. adding to and melting into the melted mixture maintained at said temperature of 110°C. to 120°C. about 1.0 to 3.0 percent by weight, on the basis of the amount of amide compound, of at least one of said oil-soluble anti-oxidizing agents;
3. dispersing the resulting melted mixture in an aqueous solution of a gellating agent and about 0.1 to 3.0 percent by weight, on the basis of the amount of amide compound, of at least one water-soluble anti-oxidizing agent by stirring said mixture at 70°C. to 85°C. until a uniform emulsion is obtained;
4. spraying the resultant emulsion, while maintained at a temperature of from 70° to 80°C., onto fine particles of a water-absorptive material which is inert and insoluble in water and has a particle size of not more than 74 microns;
5. separating the gelled beads from the fine particles of water-absorptive material, and;
6. drying the gelled beads.

3,890,434
HAIR AND ANTISEPTIC FORMULATIONS CONTAINING ADDUCTS OF BIS-(2-PYRIDYL-1-OXIDE) DISULFIDE

Guenther K. Weisse, Northford; Haywood Hooks, Jr., West Haven; Gene A. Hyde, Hamden, and Samuel I. Trotz, Orange, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 190,382, Oct. 18, 1971, Pat. No. 3,818,018. This application Mar. 28, 1974, Ser. No. 455,688
Int. Cl. A61k *7/06*
U.S. Cl. 424—70 26 Claims

8. A clear hair dressing composition comprising from about 10 to about 50% by weight of a grooming agent, from 0 to about 40% by weight of a solubilizing agent, from about 0.0001 to about 10% by weight of an adduct having the empirical formula:

$$(C_5H_4NOS)_2MY_t$$

or hydrate thereof, wherein M is an alkaline earth metal selected from the group consisting of calcium, magnesium, barium and strontium; Y is an anion selected from the group consisting of halide, sulfate, nitrate, chlorate and acetate and t is 1 or 2
and from 0 to about 89% by weight of water.

3,890,435
ANTIBIOTIC SUBSTANCE

Douglas Broadbent, Alderley Edge; Brian Frederick Burrows, Wilmslow; Stephen Barnaby Carter, Kettleshulme, and Harold George Hemming, Northenden, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Apr. 7, 1971, Ser. No. 132,181
Int. Cl. A61k *21/00*
U.S. Cl. 424—115 **2 Claims**

1. The compound cytochalasin E, said compound having the following characteristics:

melting point: variable between 200° and 200°C., but commonly 206°–209°C.

infra-red spectrum: bands having ν max (in liquid paraffin) at 3520, 3450, 3200, 3120 (all weak), 1760, 1730, 1705 (all strong), 1670, 1640, (both weak) $cm.^{-1}$

ultraviolet spectrum: no selective absorption between 225 $m\mu$ and 350 $m\mu$.

proton magnetic resonance spectrum: peaks in the region of $\tau = 2.8$ (aromatic protons) when measured in $CDCl_3$ or C_5D_5N;

peaks (doublets) centred (when measured in C_5D_5N) at $\tau = 3.16$ and τ 4.10 respectively, both having a coupling constant of 12.0 cycles per second.

mass spectrometry: heaviest ion observed:-

m/e = 495, corresponding to $C_{28}H_{33}NO_7$ other ions:-

m/e = 337, corresponding to $C_{22}H_{27}NO_2$

m/e = 246, corresponding to $C_{15}H_{20}NO_2$.

3,890,436
ANTIBIOTIC GP-3 AND PRODUCTION THEREOF BY CULTIVATION OF *BACILLUS CEREUS*

Jun'Ichi Shoji; Mikao Mayama, both of Osaka; Shinzo Matsuura, Itami; Kouichi Matsumoto, Toyonaka, and Yoshiharu Wakisaka, Takarazuka, all of Japan, assignors to Shionogi & Company, Ltd., Japan

Filed Apr. 15, 1974, Ser. No. 461,434
Claims priority, application Japan, Apr. 25, 1973, 48-47412
Int. Cl. A61k *27/00*
U.S. Cl. 424—118 **5 Claims**

1. A process for producing antibiotic Gp-3, which comprises cultivating the antibiotic Gp-3-producing strain of Bacillus ATCC 21928 in an aqueous nutrient medium under aerobic conditions, and isolating the accumulated antibiotic from the cultured broth.

3,890,437
METHOD OF INHIBITING FERTILITY IN MAMMALS USING D—PHE²—D—ALA⁶—LRF

Theodore J. Foell, and John P. Yardley, both of King of Prussia, Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 402,958, Oct. 3, 1973. This application July 5, 1974, Ser. No. 486,124
Int. Cl. A61k *27/00*; C07c *103/52*
U.S. Cl. 424—177 **1 Claim**

1. A method of inhibiting fertility in a female mammal which comprises administering to said mammal an effective amount for inhibiting fertility of a compound selected from

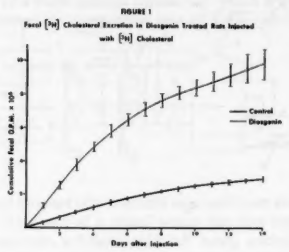
p-L-Glu-D-Phe-L-Trp-L-Ser-L-Tyr-D-Ala-Leu-L-Arg-L-Pro-ly-NH_2

and its non-toxic salts.

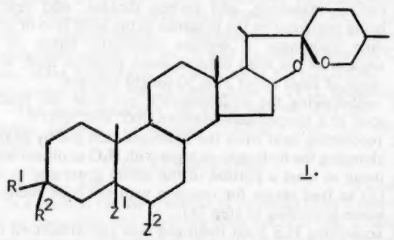
3,890,438
COMPOSITIONS AND METHODS FOR REDUCING BLOOD CHOLESTEROL

Mitchell N. Cayen, and Dushan M. Dvornik, both of Montreal, Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Sept. 17, 1973, Ser. No. 398,130
Claims priority, application Canada, Oct. 6, 1972, 153515
Int. Cl. A61k *17/00*
U.S. Cl. 424—240 **10 Claims**

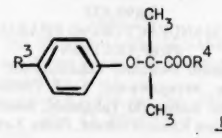


1. A method of reducing levels of blood cholesterol in humans which comprises administering to said humans a blood cholesterol lowering amount of a mixture of compound of formula 1.



1.

in which R^1 represents hydrogen, hydroxy, lower alkanoyloxy, lower alkoxy or halo and R^2 represents hydrogen, or R^1 and R^2 together represent oxo; Z^1 represents hydrogen or hydroxy, Z^2 represents hydrogen or hydroxy or Z^1 and Z^2 together represent a carbon-carbon double bond or epoxy between C-5 and C-6, and a compound of formula 11



11

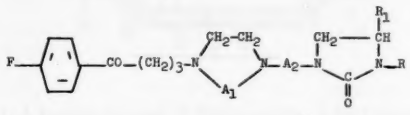
in which R^3 represents halo, lower alkyl or lower alkoxy and R^4 represents hydrogen, lower alkyl, β-pyridylmethyl, an alkali metal or an alkaline earth metal; said mixture of the compounds of formula 1 and 11 being in a ratio ranging from 19:1 to 3:2 on a weight:weight basis, respectively.

3,890,439
IMIDAZOLIDINONE DERIVATIVES IN THE TREATMENT OF EMESIS AND PSYCHOSOMATIC DISTURBANCES

Armin Zust, Birsfelden/Basel-Land, Switzerland; Walter Schindler, deceased, late of Riehen, Switzerland, and by Leonhard Gysin, executor, Basel, Switzerland, assignors to CIBA-GEIGY Corporation, Ardsley, N.Y.

Division of Ser. No. 203,870, Dec. 1, 1971, Pat. No. 3,812,126.
This application Oct. 12, 1973, Ser. No. 406,041
Claims priority, application Switzerland, Dec. 7, 1970, 18133/70
Int. Cl. A61u *27/00*
U.S. Cl. 424—250 2 Claims

1. A pharmaceutical composition for the treatment of emesis of varying origin and of psychosomatic disturbances comprising a therapeutically effective amount of a compound of the formula



wherein

A_1 represents an alkylene group having 2 to 3 carbon atoms, A_2 represents an alkylene group having 2 to 4 carbon atoms, R represents an alkyl group having 1 to 4 carbon atoms, and R_1 represents hydrogen, or an alkyl group having 1 to 4 carbon atoms,

or a pharmaceutically acceptable acid addition salt thereof and a pharmaceutically acceptable carrier.

3,890,440
NEMATICIDAL COMPOSITIONS COMPRISING 2-CHLORO-6-METHOXY-4-(TRICHLOROMETHYL)-PYRIDINE AND S-METHYL N-[(METHYL CARBAMOYL)OXY]THIOACETIMIDATE

Frances C. O'Melia, Pleasant Hill, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 25, 1974, Ser. No. 454,203
Int. Cl.[2] A01N *9/12, 9/22*
U.S. Cl. 424—263 6 Claims

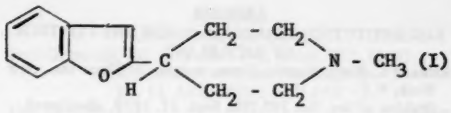
1. A synergistic nematicidal composition for use in soil which comprises an inert carrier and a mixture of toxicants consisting of about 1 part by weight of 2-chloro-6-methoxy-4(trichloromethyl)pyridine and from about ⅛ to about 16 parts by weight of S-methyl N-[(methyl carbamoyl)oxy]thioacetimidate, said mixture being present in an amount of from about 0.00001 to 90 percent by weight of the total composition.

3,890,441
PHARMACEUTICAL PREPARATIONS AND METHOD OF USE

Karl Schenker, Binningen, and Raymond Bernasconi, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 22, 1974, Ser. No. 472,332
Claims priority, application Switzerland, May 25, 1973, 7527/73
Int. Cl. A61k *27/00*
U.S. Cl. 424—267 9 Claims

1. A pharmaceutical preparation in the form of a dragee, tablet, suppository or ampoule useful for the treatment of mental depression, comprising a therapeutically effective amount of 1-methyl-4-(2-benzofuranyl)-piperidine of the formula



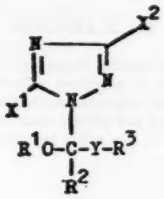
or of a pharmaceutically acceptable addition salt thereof with an inorganic or organic acid, in association with a pharmaceutical carrier.

3,890,442
1,2,4-TRIAZOLE ANTIMYCOTIC COMPOSITIONS AND USE THEREOF

Werner Meiser, Wuppertal-Elberfeld; Wolfgang Krämer, Wuppertal-Barmen; Karl Heinz Büchel, and Manfred Plempel, both of Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Sept. 11, 1973, Ser. No. 396,202
Claims priority, application Germany, Sept. 26, 1972, 2247186
Int. Cl. A61k *27/00*
U.S. Cl. 424—269 38 Claims

19. A method of treating mycoses in humans and animals which comprises administering to said human or animal an antimycotically effective amount of 1,2,4-triazole of the formula:



or a pharmaceutically-acceptable, nontoxic salt thereof, wherein

X^1 is hydrogen or alkyl of 1 to 3 carbon atoms;

X^2 is hydrogen or alkyl of 1 to 3 carbon atoms;

R^1 is phenyl or phenyl substituted by one to five substitutents selected from the group consisting of alkyl of 1 to 4 carbon atoms, the same or different halogen, the same or different haloalkyl of 1 or 2 carbon atoms and 2 to 5 halogen atoms, alkoxy of 1 or 2 carbon atoms, the same or different haloalkoxy of 1 or 2 carbon atoms and 2 to 5 halogen atoms, and nitro, or by one substituent selected from the group consistng of phenyl, halophenyl and amino;

R^2 is hydrogen or alkyl of 1 to 6 carbon atoms;

R^3 is alkyl of 1 to 6 carbon atoms; and

Y is CO;

in combination with a pharmaceutically-acceptable, nontoxic, inert diluent or carrier.

3,890,443

2-(SUBSTITUTED) THIAZOLINES FOR THE CONTROL OF RICE BLAST

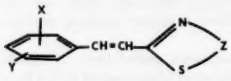
Richard C. Koch, Niantic, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 397,758, Sept. 17, 1973, abandoned, which is a division of Ser. No. 203,455, Nov. 30, 1971, abandoned, which is a continuation-in-part of Ser. No. 41,532, May 28, 1970, Pat. No. 3,624,217, which is a continuation-in-part of Ser. No. 788,642, Jan. 2, 1969, abandoned. This application Feb. 20, 1974, Ser. No. 444,137

Int. Cl. A01n *9/12*

U.S. Cl. 424—270 3 Claims

1. A process for the control of fungal disease on rice plants which comprises contacting the plants with a fungicidally effective amount, in admixture with a carrier therefor, of a compound having the formula



and the non-phytotoxic acid addition salts thereof wherein X and Y are each chloro or fluoro;

and Z is ethylene.

3,890,444

DRUG COMPOSITION

Helmuth Wawretschek, Friesoythe, Germany, assignor to Servomed Arzneimittel GmbH, Oldenburg, Germany

Filed Apr. 26, 1973, Ser. No. 354,558

Claims priority, application Germany, Apr. 26, 1972, 2220500

Int. Cl. A61k *27/00*

U.S. Cl. 424—273 6 Claims

4. The method of treating rheumatic disorder which comprises administering to a patient suffering from rheumatic disorder, an effective antirheumatic and analgesic amount of dextro-propoxyphene and phenyl butazone in mole ratio between 1 to 1 and 1 to 8 as active ingredients.

3,890,445

LACTAMIMIDE DERIVATIVES USEFUL AS HYPOGLYCEMIC AGENTS

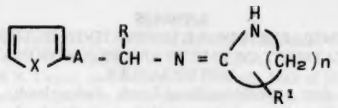
J. Martin Grisar; George P. Claxton, and Thomas R. Blohm, all of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Division of Ser. No. 321,160, Jan. 5, 1973, Pat. No. 3,816,457. This application Mar. 22, 1974, Ser. No. 453,566

Int. Cl. A61k *27/00*

U.S. Cl. 424—275 9 Claims

1. A method of inducing a hypoglycemic response in a hyperglycemic patient which comprises administering orally or parenterally to said patient an effective amount of a compound selected from the base of the formula:



wherein X is selected from oxygen or sulfur; A is selected from the group representing a bond or a straight or a branched alkylene chain of from 1 to 3 carbon atoms; R is selected from the group consisting of hydrogen or a straight or branched lower alkyl group of from 1 to 4 carbon atoms, a straight or branched lower alkenyl group of from 3 to 6 carbon atoms, a cycloalkyl group of from 3 to 6 carbon atoms and phenyl; R^1 is selected from the group consisting of hydrogen or a straight or branched lower alkyl group of from 1 to 4 carbon atoms; and *n* is an integer of from 3 to 11; and *a* pharmaceutically acceptable acid addition salt thereof.

3,890,446

CERTAIN DIGUANIDINO COMPOUNDS USED AS FUNGICIDES

John Graham Brown, Ware, and Henry Arthur Sheldon Payne, Ampthill, both of England, assignors to Murphy Chemical Ltd., Wheathampstead, St. Albans, Hertfordshire, England

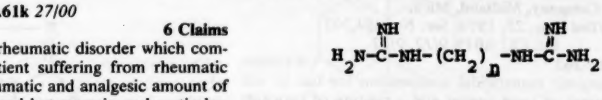
Continuation of Ser. No. 245,189, April 18, 1972, abandoned. This application Dec. 21, 1973, Ser. No. 427,141

Claims priority, application United Kingdom, Apr. 21, 1971, 10567/71

Int. Cl.[2] A01N *9/20*

U.S. Cl. 424—326 6 Claims

1. A method of preventing fungal infection in plants, and seeds, which comprises applying to the plants 0.05 to 10 kg/ha and to the seeds 0.5 to 10 g/kg of seed a compound selected from the group consisting of a compound of the formula:



and an acid addition salt thereof, wherein *n* is the integer 8, 9, or 10.

3,890,447

PERMEABLE MEAT CASINGS

Robert H. Shatney, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed June 2, 1972, Ser. No. 259,292

Int. Cl. A22c *13/00*

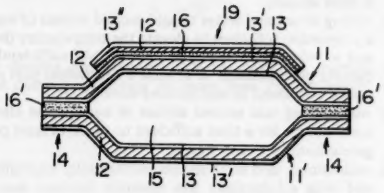
U.S. Cl. 426—105 17 Claims

1. A multilayered thermoplastic resinous film useful as a casing for smoking meat or sausage products and the like comprising a body supporting layer having a plurality of holes therethrough to allow passage of smoke into said meat or sausage products and at least one other layer which is highly permeable to the penetration of smoke and resistant to the penetration of greases.

3,890,448
HEATABLE PACKAGE OF FOOD

Senji Ito, Yokohama, Japan, assignor to Toyo Seikan Kaisha Limited, Tokyo, Japan

Filed Aug. 17, 1972, Ser. No. 281,407
Claims priority, application Japan, Oct. 5, 1971, 46-77539; Feb. 1, 1972, 47-10951; Feb. 1, 1972, 47-12752; Mar. 25, 1972, 47-30047
Int. Cl. B65b 25/22
U.S. Cl. 426—126 12 Claims

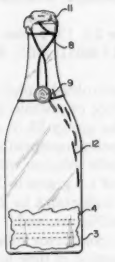


1. A heatable package of food comprising a food product encased in a packaging container, said packaging container being composed of at least one sheet material comprising a metal sheet having a thickness of 5 to 500 microns and a protecting coating layer of heat resistant resin formed on at least the inner food contacting surface of said metal sheet, said protecting layer being composed of a polyimide imidazopyrroloneimide having a thickness of 1 to 10 microns.

3,890,449
ARTIFICIALLY AGED BEVERAGE BOTTLE AND METHOD FOR PRODUCING THE SAME

Mario Suso Mezquita, Rafel Calvo, 30, Madrid, Spain

Filed May 15, 1973, Ser. No. 360,549
Int. Cl. B65d 11/6; B44c 1/06
U.S. Cl. 426—127 6 Claims

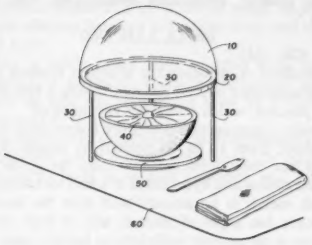


1. An artificially aged beverage container comprising:
a beverage container containing therein a beverage and having the opening thereof closed by a closure means; and
artificial aging means applied to the exterior of said container for imparting to said container an aged appearance, said artificial aging means including an aged appearing label applied to said exterior of said container; an adhesive layer covering said exterior of said container, including said label; a layer of powder irregularly and unevenly positioned over said adhesive layer; and a layer of fixer positioned over said adhesive layer and said powder layer to maintain the position of said powder layer with respect to said bottle exterior.

3,890,450
ANTI-SPLATTER DEVICE

Jack Orenstein, 245 E. Gunhill Rd., Bronx, N.Y. 10467

Filed June 24, 1974, Ser. No. 481,970
Int. Cl. A47g 19/00; A23l 1/00
U.S. Cl. 426—132 1 Claim

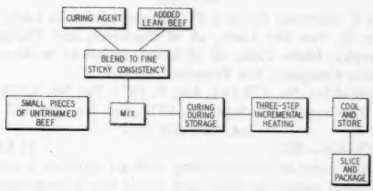


1. In combination with a horizontal surface
a grapefruit disposed on the surface;
a transparent, inverted, hemispherical hollow shell;
a horizontal ring attached to the circular edge of the shell; and
three like straight elongated vertical legs disposed around the ring at regular intervals and extending downwardly therefrom; the legs supporting the shell above the surface, directly above the grapefruit in a manner that the hands of a user can have access to the grapefruit without getting caught in the cover.

3,890,451
PROCESS OF MAKING A BACON-LIKE MEAT PRODUCT OF REDUCED FAT CONTENT

Julius L. Keszler, Boston Post Rd., Westbrook, Conn.

Filed Apr. 11, 1973, Ser. No. 350,142
Int. Cl. A23l 1/31
U.S. Cl. 426—264 7 Claims



1. A process for producing a composite bacon-like meat product of reduced fat content comprising the steps of providing small untrimmed pieces of economical meat cuts, said meat pieces being in an unfrozen condition; forming a binder for the meat pieces by blending an aqueous brine curing solution with about an equal amount by weight of ground meat to form a binder composition having a sticky paste-like consistency; cooling the binder to a temperature at least 10°F. below the temperature of the untrimmed meat pieces and intimately mixing the relatively cooler binder with the relatively warmer small meat pieces to coat the surfaces of the meat pieces with the binder; encasing the binder-untrimmed meat mixture and maintaining the encased mixture under refrigeration for a curing period of at least about 14 to 16 hours; and subsequently incrementally heating the encased cured mixture without dehydration to a surface conditioning temperature of at least about 108°F. followed by heating to a temperature of about 117°–125°F and subsequently to an internal temperature of about 135°F.

3,890,452

METHOD OF REDUCING THE AFLATOXIN CONTACT OF OILSEED MEAL PRODUCTS

Jean Brandt, Geneva; Claude Giddey, Geneva, and Guy Bunter, Carouge, Geneva, all of Switzerland, assignors to Etablissements V.Q. Petersen & Cie, Senegal

Filed Feb. 12, 1974, Ser. No. 441,741

Claims priority, application Switzerland, Feb. 13, 1973, 2005/73

Int. Cl. A23k *1/00*

U.S. Cl. 426—321 15 Claims

1. A method of reducing the aflatoxin content of an aflatoxin contaminated oilseed product having a fats content less than 10 percent, which comprises the steps of:

a. forming a homogeneous mixture comprising; the crushed product, from 10 to 40 percent by weight of water, at least one basic agent selected from the group consisting of the oxides and hydroxides of alkali metals and alkaline earth metals in an amount such that the homogeneous mixture has a pH of least 8, and at least one organic amine in an amount sufficient to further raise the pH to at least 9.5;

b. reacting the homogeneous mixture by maintaining the product at a temperature between room temperature and 150°C for a time sufficient to reduce the aflatoxin content of the product to less than 100 ppb; and

c. drying the resulting detoxified product to reduce its water content.

3,890,453

FORMING SHAPED POTATO PIECES FROM POTATO DOUGH

James F. Harmon; Richard D. Johnston; John H. Lach; William H. Von Der Lieth, all of Blackfoot, and Thomas L. Murphy, Idaho Falls, all of Idaho, assignors to American Potato Company, San Francisco, Calif.

Division of Ser. No. 170,164, Aug. 9, 1971, Pat. No. 3,771,937. This application Sept. 17, 1973, Ser. No. 398,042

Int. Cl. A23l *1/12*

U.S. Cl. 426—503 11 Claims

1. A process of reconstituting without agitation a mass of dehydrated potato product and water into a homogeneous potato dough suitable for shaping into French-fry potato pieces comprising the steps of:

a. providing a variable volume chamber for constraining the contents of the chamber an outlet opening and an inlet opening and a reciprocable piston within the chamber for consolidating the contents thereof:

b. sealing the outlet opening of the chamber with an externally mounted liquid impervious member;

c. metering a predetermined quantity of dehydrated potato product and water into the chamber in front of the piston through the inlet opening;

d. consolidating the contents by moving the piston within the chamber toward the outlet end of the chamber thereby reducing the volume of the chamber to a predetermined volume bounded by the impervious member, the chamber and the piston so that the water substantially fills the available voids in and between the individual dry product particles without agitation to form a homogeneous dough suitable for forming into French-fry-cut potato pieces.

3,890,454

METHOD OF CONDITIONING MEAL

Robert Jan Nijweide, Rosmalen, Netherlands, assignor to Verenigde Mengvoederfabrieken, Tramkade, 24, Netherlands

Filed Jan. 8, 1974, Ser. No. 431,707

Claims priority, application Netherlands, Jan. 17, 1973, 7300679

Int. Cl. A23b *9/00*

U.S. Cl. 426—508 3 Claims

1. In a method of making food products by extruding moist meal through the die holes of a pellet press, the steps of

a. providing a first stream of meal;

b. dividing said first stream of meal into a second stream and a third stream;

c. adding steam and water to said second stream of meal in a proportion sufficient to elevate the temperature thereof and to raise the moisture content thereof sufficiently for causing gelatinization of at least a substantial part of the starch contained in said second stream;

d. maintaining said second stream of meal at the elevated temperature for a time sufficient to cause at least partial gelatinization of said starch;

e. maintaining said third stream substantially ungelatinized and with substantially less moisture content than said second stream; subsequently

f. mixing said second stream with said third stream to produce a fourth stream of meal; and

g. feeding said fourth stream to said die holes;

the third stream having a size and moisture content relative to the size and moisture content of the second stream to produce a moisture content and tackiness in the fourth stream favorable for extruding through the die holes to produce pellets wherein the meal is cemented together by the gelatinized starch, the moisture content of the third stream being less than that necessary to result in substantial gelatinization of the meal by heating.

3,890,455

METHOD OF ELECTROLESSLY PLATING ALLOYS

Donald F. Ballas, Underhill, Vt.; San-Mei Ku, Poughkeepsie, and John C. Marinace, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 23, 1972, Ser. No. 265,948

Int. Cl.[2] H01L *7/00;* B05D *5/12*

U.S. Cl. 427—85 3 Claims

1. Method of electrolessly plating a doped gold alloy contact onto the surface of a semiconductor substrate including elements from the group III–V elements or mixed compounds of these elements, comprising the steps of:

mixing a gold chloride solution with a solution of zinc chloride in the ratio of 1.5 grams to 3.0 grams crystalline gold chloride to 400 milligrams to 200 milligrams zinc for a solution of 50 millileters; and

immersing the semiconductor substrate in said mixed solution for a fixed period of time until a desired thickness of doped gold alloy has been plated onto said substrate, thereby plating zinc doped gold onto said semiconductor substrate at an initial rate of 2,000 to 2,500 angstroms in approximately 2–3 minutes at room temperature.

3,890,456

PROCESS OF COATING A GAS TURBINE ENGINE ALLOY SUBSTRATE

Ray R. Dils, Madison, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

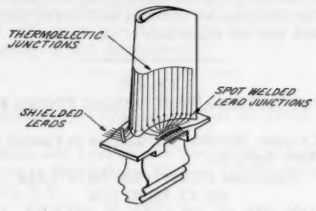
Filed Aug. 6, 1973, Ser. No. 386,266

Int. Cl. B44d *1/14*

U.S. Cl. 428—216 14 Claims

1. In a method for coating nickel-base, cobalt-base or iron-

base gas turbine engine alloy substrates having an initial rare earth and aluminum-containing nickel-, cobalt- or iron-base



alloy coating approximately 0.5–5.0 mils thick thereon, said initial coating containing no more than 2%, by weight, rare earth metal and approximately 5–25%, by weight, aluminum, the improvement which comprises:

mechanically working the surface of said initial layer to induce irregularity and angular topography in the aluminum oxide to be produced;

oxidizing said initial layer to produce an irregular aluminum oxide layer approximately 0.05–0.1 mil thick to promote mechanical adherence of a noble metal layer and to prevent alloying between said initial layer and said noble metal layer;

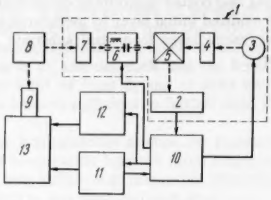
depositing a noble metal layer selected from the group consisting of platinum, rhodium, palladium and alloys thereof on said oxidized initial layer to a thickness of approximately 0.1–0.2 mil; and

oxidizing said coated substrate to cause additional growth of said oxidized initial layer to metallurgically insulate said noble metal layer from said substrate and said initial layer.

3,890,457
DEVICE FOR PROGRAM CONTROLLING METAL REMELTING PROCESSES

Pavel Ioelievich Fain, ulitsa Shamsheve, 15b, kv. 6; Vladimir Anatolievich Zimin, ulitsa Sojuza Svyazi, 13, kv. 5; Aron Zakharovich Strashun, prospekt Engelsa, 69, kv. 55; Tamara Ivanovna Isupova, ulitsa Vernosti, 34, kv. 67; Alexandr Ivanovich Pankratov, prospekt Engelsa, 17, kv. 58, and Georgy Ivanovich Romanov, naberezhnaya reki Fontanki, 127, kv. 3, all of Leningrad, U.S.S.R.

Filed Feb. 21, 1974, Ser. No. 444,667
Int. Cl. F27d *11/10*
U.S. Cl. 13—13 **3 Claims**

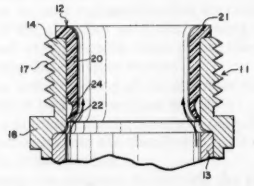


1. A device for program control of metal remelting processes in an electroslag remelting furnace having an electrode for remelting, and a mechanism for displacing said electrode, by controlling at least one parameter based upon, respectively, the remelting current, the voltage of the electroslag remelting furnace, the ohmic resistance of the molten slag in said electroslag remelting furnace, and the power released in the electroslag remelting furnace depending on the duration of the remelting process and the position of said electrode in the electroslag remelting furnace, said electorde being connected to said mechanism for displacing said electrode in the electroslag remelting furnace, comprising:
   a. two units for effecting programmed changes in the parameter being controlled;
   b. a converter for converting the displacement of said electrode into an electric signal; and
   c. a control unit for operating said units for the programmed changes in the parameter being controlled in dependence upon signals received from said converter.

3,890,458
TUBULAR COUPLING WITH INSULATIVE THROAT LINER

Thomas Mooney, Mt. Sinai, N.Y., assignor to I-T-E Imperial Corporation, East Farmingdale, N.Y.

Filed Mar. 14, 1974, Ser. No. 451,177
Int. Cl. H02g *3/04*; H01b *17/58*
U.S. Cl. 174—83 **10 Claims**

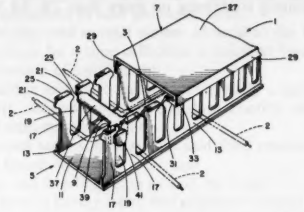


1. A coupling comprising an outer collar having an inside face and an outside face, and an inner sleeve formed of a compressible flexible polymeric resin telescoping said collar, said sleeve in its unstressed state having an outside diameter greater than and a length less than that of the inside face of said collar and having a peripheral recess in its outer face proximate its inner end and said sleeve being peripherally radially compressed in its collar telescoping position and the inner end thereof being outwardly deflected under the influence of the compressive stress in said sleeve into intimate engagement with the inside face of said collar.

3,890,459
WIREWAY SYSTEM AND RETAINING FINGER FOR USE THEREIN

Jack E. Caveney, Hinsdale, Ill., assignor to Pandult Corporation, Tinley Park, Ill.

Filed June 17, 1974, Ser. No. 479,944
Int. Cl. H02G *3/04*
U.S. Cl. 174—101 **13 Claims**



1. A wireway system for channelling, selectively routing and retaining the various wires of a wire bundle interconnecting components of an electrical system, said wireway system comprising:
   a channel-shaped duct for receiving the wire bundle and having an elongate base and two substantially parallel duct walls extending generally perpendicularly from said base with each of the walls disposed adjacent respective longitudinal edges thereof, at least one of said duct walls comprising at least a pair of adjacent duct fingers which define a slot permitting selective routing of various wires of said bundle, said duct fingers having distal ends which are resiliently deflectable transversely to the longitudinal direction of said base, one finger having an ear adjacent its distal end extending toward the other finger to define a restricted throat to said slot; and
   at least one retaining finger for retaining wires within the duct and for permitting the addition of wires to said bundle, said retaining finger having a base portion engaging said pair of adjacent duct fingers and further having a finger portion extending generally perpendicularly to said base portion, said base portion comprising first and second spaced walls joined by a support, said first and second spaced walls and said support defining opposed grooves for reception of said pair of adjacent duct fingers, the longitudinal extension of the first and second spaced walls relative to said duct being sufficient to overlap said adjacent duct fingers, said base portion including an abutment surface engaging said ear to hold the base portion adjacent the distal end of said one finger, said retaining finger being mounted on said duct with the first of the spaced walls disposed between the duct walls whereby the retaining finger is captively held by said duct fingers with the first and second spaced walls of said base portion preventing significant movement of said retaining finger transversely of said duct and with the finger portion extending at least partially across the base of said duct to retain wires in said duct while permitting the insertion of additional wires into the duct.

12. A retaining finger comprising:
   a base portion including first and second spaced walls joined by a support to define opposed grooves with one side of

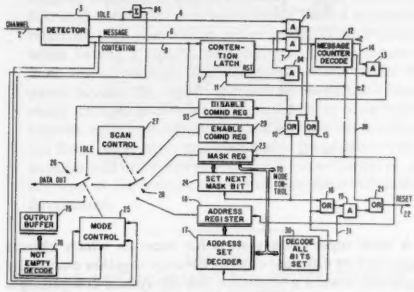
said support including a discontinuity constituting abutment means; and

a finger portion extending generally perpendicularly from said base portion whereby said finger is adapted to be mounted on a flexible wall having at least one open-ended slot with an ear extending into the slot and engagable by a surface of said discontinuity.

3,890,460
COMMUNICATIONS ENABLING METHOD AND APPARATUS

Lee C. Haas, and Lynn Parker West, both of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,166
Int. Cl. H04q *5/00;* **H04e** *11/00*
U.S. Cl. 178—2 C **15 Claims**



9. Apparatus for controlling individual access for the transmission of messages on a communications channel from the plurality of remote stations interconnected by said channel, comprising:

means for inviting responses simultaneously from a first plurality of said remote stations by signals sent from said central station on said channel;

means for receiving at said central station any of said responses so initiated by said invitation reaching any of said first plurality of remote stations which have messages to transmit at the time they are so invited;

means for comparing said received responses, during the receipt thereof at said central station, with predetermined response format patterns to determine whether more than one said response is then being received in conflict with another said response; and

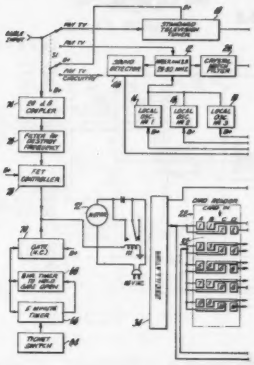
selection means, responsive to and connected to said means for comparing, for selecting progressively smaller pluralities of said remote stations and for controlling said inviting means to reinvite said selected pluralities to respond simultaneously, whenever said conflict between responses is determined to exist, until a response is received without conflict.

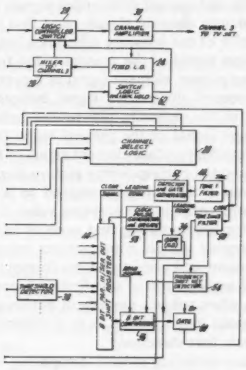
3,890,461
TICKET OPERATED SUBSCRIPTION TELEVISION RECEIVER

Joseph H. Vogelman, Roslyn; Stanley D. Spiegelman, Old Bethpage, and Jack Berens, Laurelton, all of N.Y., assignors to TheatreVision, Inc., Woodbury, L.I., N.Y.

Filed Mar. 27, 1973, Ser. No. 345,366
Int. Cl. H04n *1/44*
U.S. Cl. 178—5.1 **20 Claims**

1. A subscription television receiver for receiving a scrambled television signal including a series of tones at first and second frequencies, said receiver comprising means for receiving the scrambled television signal and said binary program identification signal, means for permitting, when enabled, the received scrambled television signal to be viewed in an unscrambled form, means for receiving a program-select card containing a first plurality of conductive areas selectively arranged on an insulating surface, the presence of one of said first plurality of conductive areas representing one binary level and the absence of one of said conductive areas representing a second binary level, whereby the arrangement of said first plurality of conductive areas on said cardd defines a binary card identification code, said card-receiving means comprising a member including a second plurality of conductive areas arranged in orthogonally intersecting rows and columns, each of said first plurality of conductive areas on said card being located when said card is received in said card-receiving means adjacent to but not in contact with adjacent ones of said second plurality of conductive areas,





thereby to modify an electrical parameter of selected adjacent ones of said conductive areas, a signal source operatively connected to the conductive areas of one of said columns in said card-receiving means, switch means interposed between said signal source and said card-receiving means for applying, when actuated, the output of said signal source to the conductive areas on said one column, means for detecting the received binary program identification signal and including means for detecting said tones at said first frequency and said tones at said second frequency, means for actuating said

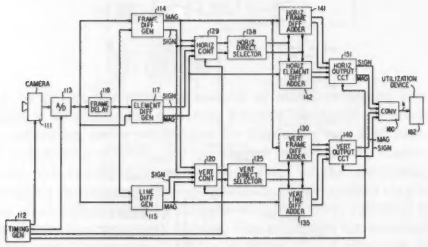
switch means upon the detection of said first frequency tone, and means for producing a binary program identification signal corresponding to the sequence of said tones at said second frequency, means for comparing said card identification code signal and said program identification signal, and means for producing an enabling signal for said permitting means when said card identification code signal corresponds to said program identification signal.

3,890,462

SPEED AND DIRECTION INDICATOR FOR VIDEO SYSTEMS

John Ormond Limb, New Shrewsbury, and John Arthur Murphy, Freehold Township, Monmouth County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 17, 1974, Ser. No. 461,586
Int. Cl. H04n 7/02
U.S. Cl. 178—6.8 **9 Claims**



1. In combination,

a signal source for supplying successive frames of a video signal including a representation of a moving subject;

first comparing means connected to said signal source for supplying first and second differential signals derived by comparing picture element signals, said first differential signal indicative of the intensity difference between each picture element signal of the present video frame and a corresponding picture element signal of a previous video frame, said second differential signal indicative of the combination of the intensity differences between each picture element signal of the present video frame compared to a preceding picture element signal of the present video frame and the corresponding picture element signal in the previous video frame compared to a preceding picture element signal in the previous video frame;

storing means for accumulating first sums of said first and second differential signals when subject movement between the present and previous video frames is in a first direction and second sums of said first and second differential signals when subject movement between the present and previous video frames is in a second direction opposite to said first direction;

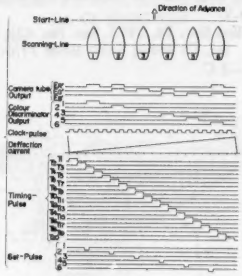
evaluating means including second comparing means and first magnitude means, said second comparing means compares the first and second sums of said first differential signal to provide a directional signal indicative of the direction of movement, said first magnitude means providing a first magnitude signal proportional to the magnitude of said directional signal and also providing a second magnitude signal which is representative of an algebraic combination of at least the first and second sums of said second differential signal, said first magnitude means further comprising dividing means for providing a signal representative of a division of said first magnitude signal by said second magnitude signal to determine the speed of movement.

3,890,463

SYSTEM FOR USE IN THE SUPERVISION OF A MOTOR-BOAT RACE OR A SIMILAR TIMED EVENT

Yoshizo Ikegami, Amagasaki, and Kenzo Yamanouchi, Kobe, both of Japan, assignors to Konan Camera Research Institute, Japan

Filed Mar. 19, 1973, Ser. No. 342,376
Claims priority, application Japan, Mar. 21, 1972, 47-28371; July 29, 1972, 47-26309
Int. Cl. H04n 9/02
U.S. Cl. 178—6.8 **11 Claims**



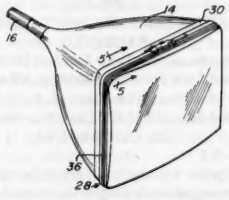
1. A race supervision system for races in which objects distinguished by different colours advance together essentially in alignment toward a reference line the system comprising a first colour television camera assembly means for movably scanning along the reference line and for producing video signal outputs in which the voltages vary in accordance with the proportions of primary colours present in the colours of objects scanned, a coded pulse generation means for producing coded pulse outputs which vary in accordance with variations in the output of said first colour television camera assembly means, a continuous timing pulse generation means for generating pulse trains in which each succeeding pulse is emitted as said first colour television camera assembly means scans each successive portion of the scanning line, and a recording means for recording coded signals when the timing pulses and the coded pulse outputs are supplied simultaneously thereto, said recording means having the contents thereof being arranged for reading out.

3,890,464

DRY, IMPULSE-RESISTANT IMPLOSION PROTECTION SYSTEM FOR LARGE SCREEN CATHODE RAY TUBES

Monty Hill, and Curtis Uthene, both of Chicago, Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed Dec. 10, 1973, Ser. No. 423,037
Int. Cl. H01j 61/50
U.S. Cl. 178—7.8 **5 Claims**



1. A large screen cathode ray tube having an improved dry, impulse-resistant implosion protection system, comprising:

a glass bulb consisting of a front panel having a faceplate whose inner surface is coated with red-emissive, blue-emissive and green-emissive phosphor elements, and a funnel section terminating in a neck in which one or more electron guns are situated for generating electron beams to illuminate said phosphor elements, said front panel and funnel section being joined together to form an air-tight envelope;

a strip of relatively incompressible tape secured to and encircling the bulb and situated on the forward part of the bulb near the faceplate;

a first steel tension band placed directly over the tape and tensed to provide hoop compression on the bulb, the opposite ends of said tension band being secured together to prevent relative motion thereof;

a second steel tension band placed directly over the first band and also tensed to provide hoop compression on the bulb, the opposite ends of said second tension band being secured together to prevent relative motion thereof, said first and second tension bands being tensed to provide a relatively high cumulative compression on the front panel while having a rigidity and being so tightly secured at their respective ends that when a fracture of the front panel occurs, the resulting tensil strain in each band is small enough to inhibit the propagation of a fracture impulse so as to substantially confine bulb devacuation to the front panel, thus ensuring that a front panel fracture impulse will not propagate to the weaker funnel or neck portions of the bulb until the bulb has been substantially devacuated.

3,890,465

CIRCUIT ARRANGEMENT FOR PROTECTION OF A SPEAKER SYSTEM

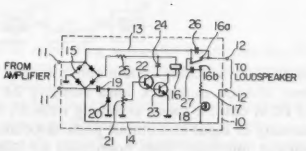
Yasuo Kaizu, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed July 10, 1973, Ser. No. 377,969

Claims priority, application Japan, July 11, 1972, 47-69448; Mar. 9, 1973, 48-29364[U]

Int. Cl. H02h *3/28*

U.S. Cl. 179—1 VL **4 Claims**



1. A loudspeaker protection circuit for cutting off an input signal applied to a loudspeaker when the input signal exceeds a predetermined level, comprising:

a. input means for receiving an input signal;

b. output means for applying the input signal to said loudspeaker;

c. circuit means including a relay having a normally closed contact electrically connecting said input means to said output means for applying the input signal to the output means;

d. first rectifying means receptive of the input signal for developing a first rectified signal representative of the amplitude of the input signal;

e. a control device having a conductive state and a non-conductive state and a control electrode for receiving a signal to control its conductive state;

f. second rectifying means receptive of the input signal for developing a second rectified signal representative of the amplitude of the input signal;

g. means applying said second rectified signal to said control electrode of said control element; and

h. means electrically connecting said first rectifying means with said control device and said relay to energize said relay with said first rectified signal to open said normally closed contact and disconnect said output means from said input means when said first rectified signal exceeds a predetermined level determined by said second rectified signal.

3,890,466

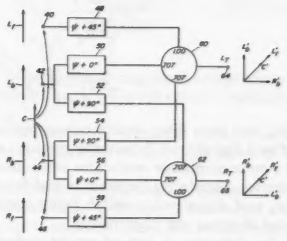
ENCODERS FOR QUADRAPHONIC SOUND SYSTEM

Benjamin B. Bauer, Stamford, Conn., assignor to CBS Inc., New York, N.Y.

Continuation-in-part of Ser. No. 328,814, Feb. 1, 1973, abandoned, which is a continuation-in-part of Ser. No. 251,544, April 21, 1972, abandoned, Continuation of Ser. Nos. 44,224, June 8, 1970, abandoned, Ser. No. 124,135, March 15, 1971, Pat. No. 3,821,471, and Ser. No. 288,829, Sept. 13, 1972, abandoned. This application July 31, 1973, Ser. No. 384,334

Int. Cl. H04r *5/00*

U.S. Cl. 179—1 GQ **33 Claims**



1. Apparatus for transforming a multi-channel program including at least first, second, third and fourth program signals into two composite signals, said apparatus comprising:

first, second, third and fourth input terminals to which said first, second, third and fourth signals to the extent they are present are respectively applied,

first and second output terminals,

means connected between said first and fourth input terminals and said first and second output terminals, respectively, operative to transfer substantially equal amplitude proportions of said first and fourth signals to said first and second output terminals, respectively, and

means connected between both said second and third input terminals and both said first and second output terminals operative to transfer substantially equal reduced amplitude proportions of said second and third signals to both said first and second output terminals and including phase-shifting networks operative to provide a substantially constant differential phase-shift angle between said second and third signals at one of said output terminals and said second and third signals, respectively, at the other of said output terminals over the frequency range of interest.

3,890,467

DIGITAL VOICE SWITCH FOR USE WITH DELTA MODULATION

Joseph A. Sciulli, Rockville, Md., assignor to Communications Satellite Corporation, Washington, D.C.

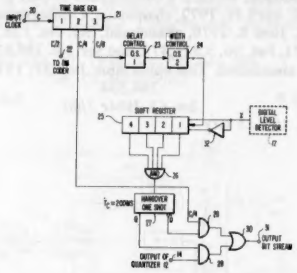
Filed Nov. 1, 1973, Ser. No. 411,878

Int. Cl. H04b *15/00*

U.S. Cl. 179—1 VC **6 Claims**

1. A digital voice switch for use in a speech communication system including a continuously variable delta modulator having comparator means for comparing an input speech signal to be encoded and a synthesized feedback signal and

producing a difference signal, quantizing means for receiving said difference signal and a clock signal and generating an output bit stream consisting of binary 1's and 0's for transmission by said communication system, a binary 1 being produced when said difference signal is positive and a binary 0 being produced when said difference signal is negative, feedback integrator means connected to receive said output bit stream for producing said synthesized feedback signal having a stepped waveform, and an adaptive feedback control means including a digital level detector connected to receive said output bit stream and producing an output on the detection of a first predetermined number of consecutive 1's in said output



bit stream, low pass filter means connected to receive the output of said digital level detector to produce a control voltage, and a pulse amplitude modulator controlled by said control voltage for modulating the input to said feedback integrator means, said digital voice switch being connected to said digital level detector and comprising:

means for detecting a second predetermined number of consecutive binary 1's in said output bit stream by sampling the output of said digital level detector; and

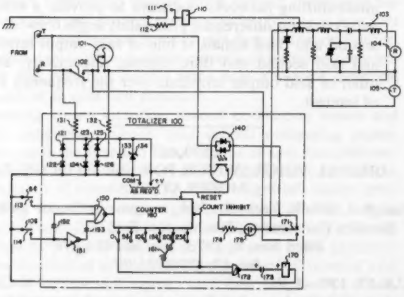
means responsive to said detecting means for gating said output bit stream for transmission by said communications system whenever said second predetermined number of consecutive 1's is detected.

3,890,468

CIRCUIT ARRANGEMENT FOR GROUND START COIN OPERATED TELEPHONES

Robert V. Burns, Tinley Park, and Richard J. Hamilton, West Chicago, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 3, 1973, Ser. No. 421,301
Int. Cl. H04m *17/02*
U.S. Cl. 179—6.5 **8 Claims**



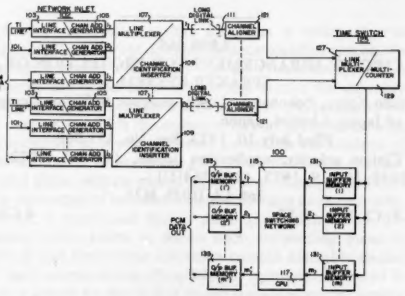
1. A coin operated telephone instrument adapted for connection to a telephone central office by means of a telephone line, said central office of the type requiring a ground start signal from said instrument prior to origination of a call by said instrument, said instrument comprising: a transmitter, a receiver, a calling device, a coin detecting mechanism normally inhibiting origination of a call by said instrument, said coin detecting mechanism operated in response to deposit of a first coin of any value to transmit a ground start signal to said central office over said telephone line; and a totalizer comprising counting means advanced once in response to deposit of each coin of a first value and advanced twice in response to deposit of each coin of a second value, said counting means initially operated to generate a first output in response to a first advance and further operated to generate a second output in response to a predetermined number of additional advances; switching means connected to said counting means initially operated in response to said counting means first output to further inhibit origination of a call by said instrument, and further operated in response to said counting means second output to permit origination of a call by said instrument.

3,890,469

TIME DIVISION SWITCHING SYSTEM

Michael J. Kelly, Melrose Park, and Satyan G. Pitroda, Villa Park, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 4, 1973, Ser. No. 421,701
Int. Cl. H04j *3/00*
U.S. Cl. 179—15 AT **10 Claims**



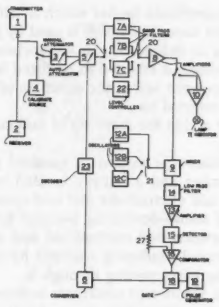
1. A time division switching system comprising: a plurality of input time division multiplex lines carrying 24 channel multiplexed PCM data, a space switching network having a different plurality of input and output ports associated therewith and output multiplex lines connected to said output ports, network inlet means receiving said input multiplex lines and providing synchronization and frame detection for said multiplexed PCM data, said network inlet means including channel address data generator means for inserting channel address data to accompany said multiplexed PCM data, means for multiplexing and distributing on a plurality of supermultiplexed lines said PCM data and said channel address data to provide therefrom a supermultiplexed time frame format and including channel indentification inserter means for inserting channel indentification coding in said supermultiplexed format channel aligner means cumulatively receiving said supermultiplexed format for separately outputting said PCM data and said channel address data, said channel aligner means referencing the selection of said PCM and said channel address data from said supermultiplexed format according to said channel identification coding, means for distributing said PCM data according to the coding of said channel address data, said distributing thereof providing another multiplexed time frame format having a lower channel occupancy level per line than said supermultiplexed format and distributed on a plurality of multiplex lines greater than said number of supermultiplexed lines, means for storing said PCM data as distributed, and means for controlling the transferring of stored

PCM data to said switching network inlet ports according to said other multiplexed time frame format and controlling said switching network for switching said PCM data from said inlet to said outlet ports thereof.

3,890,470
MEASUREMENT OF NOISE IN A COMMUNICATION CHANNEL

Edgar Robert Allen, Stanmore, England, assignor to The Post Office, London, England

Filed Dec. 11, 1973, Ser. No. 423,809
Claims priority, application United Kingdom, Dec. 14, 1972, 57639/72
Int. Cl. H04j 1/16
U.S. Cl. 179—15 BF **8 Claims**

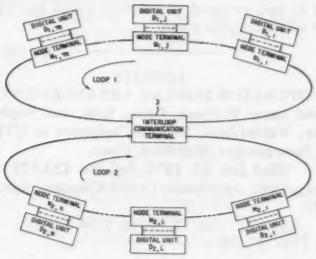


1. A NPR measuring apparatus for measuring the NPR of a selected channel in a frequency multiplex transmission system said apparatus comprising:
- tapping means for extracting a broad band signal from said frequency multiplex transmission system;
- incrementally variable attenuator means connected to an output of said tapping means;
- filter means for isolating a frequency band within said channel;
- first switch means for connecting an output of said attenuator means and a selected input of said filter means;
- oscillator means for generating a signal having a frequency equal to the center frequency of said frequency band;
- mixer means having a first input connected to an output of said oscillator means, a second input and an output;
- second switch means connected between an output of said filter means and said second input of said mixer means; broad band level preset means connected between said first switch means and said second switch means;
- detector means connected to an output of said mixer means; comparator means having a first input connected to an output of said detector means, a second input and an output;
- reference voltage means connected to said second input of said comparator means; and
- digital drive means connected to the output of said comparator means, an output of said digital drive means connected to a control terminal of said incrementally variable attenuator.

3,890,471
LOOP DATA TRANSMISSION ARRANGEMENT EMPLOYING AN INTERLOOP COMMUNICATION TERMINAL

Victor Hachenburg, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 17, 1973, Ser. No. 424,934
Int. Cl. H04j 3/08
U.S. Cl. 179—15 AL **11 Claims**

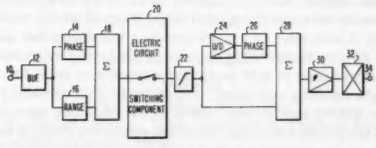


1. In a data transmission arrangement comprising a plurality of data transmission loops, an interloop communication terminal comprising:
- first means for monitoring messages received on a first of said loops to determine the busy/idle status of said first loop;
- second means for detecting a message destined for said first loop and received on a second of said loops; and
- means coupled to said first means and to said second means for transmitting on said first loop, if said first loop is idle, a message destined for said first loop and received on said second loop or for storing said message if said first loop is busy.

3,890,472
TRANSPARENT TIME-DIVISION PULSE-MULTIPLEX DIGITAL ELECTRIC SIGNAL SWITCHING CIRCUIT ARRANGEMENT

Dale Edward Fisk, San Jose, and Merle Edward Homan, Los Gatos, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 3, 1974, Ser. No. 475,683
Int. Cl.² H04J 3/06
U.S. Cl. 179—15 AW **10 Claims**



1. A time-division pulse-multiplex digital electric signal switching circuit arrangement of the type having an electric signal switching component through which an electric signal is translated by interconnecting switching input and output terminals for a predetermined portion only of a time cycle, comprising
- input terminals at which a pulse coding modulated electric signal wave is applied,
- output terminals at which a regenerated pulse coding modulated electric signal wave is delivered in substantially the same form as that of said electric signal wave applied at said input terminals,

a circuit coupled between said signal input terminals and said switching input terminals having circuitry for driving a component electric wave of polarity and amplitude proportional to the amplitude of said signal wave, circuitry for deriving a component electric wave of amplitude value representative of the time relationship of the transistions in said electric signal wave to said time cycle of said switching component and circuitry for summing the amplitudes of said component electric waves, and

a circuit coupled between said switching output terminals and said signal output terminals having circuitry responsive to said summed component waves for regenerating said electric signal wave.

3,890,473
OPERATOR DISPLAY ARRANGEMENTS

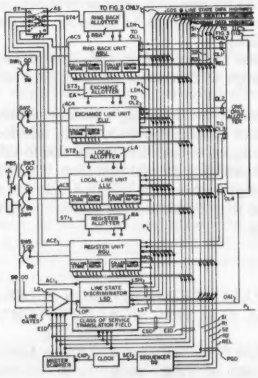
Bloomfield James Warman, Como, Italy, and Stephen Sidney Walker, Walderslade, England, assignors to GTE International Incorporated, Stamford, Conn.

Filed Jan. 14, 1974, Ser. No. 433,329

Claims priority, application United Kingdom, Apr. 19, 1973, 19183/73

Int. Cl. H04m *3/64*

U.S. Cl. 179—27 DB **6 Claims**



1. An arrangement for the display of information appertaining to the lines served by a telephone exchange, each said line having a corresponding address, which comprises an electronic display means composed of an array of light emitting elements or areas the spatial disposition of which within the array is indicative of a corresponding telephone line address, said display means being capable of displaying information by the stimulation of said particular elements or areas thereof to a light emitting condition, one or more data signalling highways linking said display means to the switching apparatus of said telephone exchange, interface means for priming sequentially, in synchronism with signals from an address generating means for the successive and cyclic generation of telephone line address signals, said individual elements or areas of said display means allocated to predetermined telephone lines served by said exchange, and means within said exchange switching apparatus for generating line information signals in time division multiplex under control of said address generating means, each information signal appertaining to a particular line address, said information signals, together with synchronizing signals from said address generating means being applied to said display means via said one or more data signalling highways, each said information signal being so synchronized to said address generating means that in accordance with the particular element or area of said display means that is stimulated to said light emitting condition the identity of the corresponding telephone line can be determined.

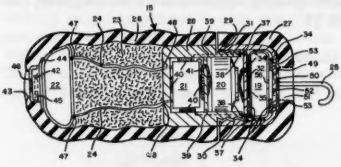
3,890,474
SOUND AMPLITUDE LIMITERS

Raymond C. Glicksberg, 704 Santa Monica Blvd., Santa Monica, Calif. 90401

Continuation-in-part of Ser. No. 253,935, May 17, 1972, abandoned. This application Dec. 26, 1973, Ser. No. 427,911

Int. Cl. H04p *25/02*

U.S. Cl. 179—107 E **10 Claims**



1. A sound-amplitude limiter which is self-contained in the ear canal of the user, and which is used by persons with normal hearing as an indentical pair, comprising:

a. a casing which is adapted to be fitted into the ear canal;

b. a microphone within the outer tip of said casing adjacent the external ear;

c. a speaker within the inner tip of said casing adjacent the ear drum;

d. an amplifier-type circuit of nominal gain of one with output-limiter and a battery located within said casing between said microphone and said speaker;

e. a plug of sound-deadening material located within said casing between said microphone and said speaker, said plug of sound-deadening material having two electrical connecting wires passing through it;

f. the above mentioned electronic components hooked-up in operable relationship as a miniature public address system so that sound inputs above the limit of comfort for the human ear are reduced to that limit at the ear drum, while sound inputs below said limit are electronically reproduced at the ear drum.

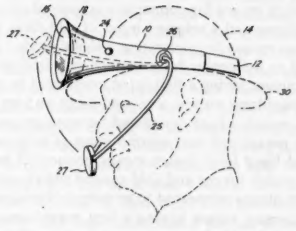
3,890,475
SELF-CONTAINED VOICE AMPLIFICATION HEADGEAR

Robert R. Denhart, Route 2, Box 741, Rosenberg, Tex. 77471

Filed Jan. 30, 1974, Ser. No. 437,990

Int. Cl. H04m *1/05*

U.S. Cl. 179—156 A **6 Claims**



1. A self-contained voice amplification headgear comprising,

a housing arranged to be carried externally by the head, hat or helmet of the user,

a speaker carried by the housing,

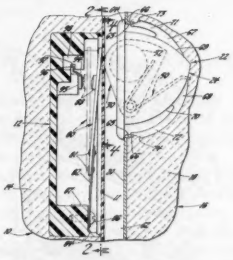
an amplifier electrically connected to the speaker carried by the housing,

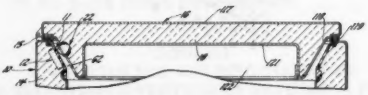
an electrical power source carried by the housing,
a microphone arm pivotally connected to the housing,
a microphone electrically connected to the amplifier and carried by the microphone arm,
the microphone arm operable to swing the microphone to a downward position in front of the mouth of the user and upwardly and away from the mouth and face of the user into an out-of-the-way position, and
an on-off switch operable to connect the electrical power source to the amplifier when the microphone arm is in the downward position and operable to disconnect the electrical power source from the amplifier when the microphone arm is in the out-of-the-way position.

3,890,476
APPLIANCE CABINET WITH ACTUATED DOOR SWITCH

James A. Canter, Englewood, and Robert Smith, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 8, 1974, Ser. No. 495,872
Int. Cl. H01h *3/16, 36/00*
U.S. Cl. 200—61.62 **3 Claims**



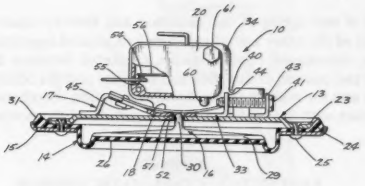


1. A magnetic switch assembly for a cabinet member having walls defining a chamber therein provided with an access opening, a door member for said chamber access opening movably mounted on said cabinet member from a closed position in the access opening comprising, an open ended socket molded of non-magnetic material engaged in an aperture of the door member, a non-magnetic housing pivotally supported in said socket having a first permanent-magnet enclosed therein, means resiliently biasing said housing outwardly from said socket open end, a switch case mounted on the underside of an upright non-magnetic jamb portion of said chamber access opening, a fixed contact in said case at one end thereof, said case located in adjacent spaced relation with said socket open end when said door is closed whereby said magnet housing is urged into contact with said jamb portion by said biasing means, said switch including an electrically conducting leaf spring mounted at the opposite end of said case having an elongated contact carrying armature plate connected to and extending from said leaf spring free end past said fixed contact for cantilever movement in said case, a contact on said movable armature plate, said armature plate biased by said leaf spring in a plane substantially parallel to said jamb portion whereby its movable contact is closed to said fixed contact, a relatively weak second permanent magnet located in said case at the opposite end thereof so as to be positioned adjacent said armature plate to close said contacts in a snap-action manner upon said door being opened, and whereby upon said door being closed said first permanent magnet provides an attraction force on said armature plate of a magnitude sufficient to overcome the attraction of said second magnet and said leaf spring to hold open said contacts while said door is closed.

3,890,477
CONTROL DEVICE

James F. Saunders, Clarksville, Tenn., assignor to The Maytag Company, Newton, Iowa

Filed May 18, 1973, Ser. No. 361,561
Int. Cl. H01h *5/20, 35/34*
U.S. Cl. 200—83 P **3 Claims**



1. A double snap-action pressure-responsive switch comprising: a supporting base defining an opening; bracket means fixed to said base defining first and second spaced-apart supports; an elongated snap-action actuator fixed at one end to a first of said supports for preventing movement of said one end of the actuator and pivotally supported at the other end to the second support at a distance from said first support of less than the actual length of said actuator to subject said actuator to longitudinal compression and deformation for forming said actuator in a first position comprising a stable arcuate condition; input signal means including a movable plunger extending through the opening in said supporting base and a resilient diaphragm fixed along its periphery to said supporting base and operable on said plunger, said plunger being engageable with said actuator in said first position and operable responsive to a predetermined pressure on said diaphragm for moving said actuator from said first arcuate position to an unstable intermediate second position from which said actuator is movable by snap action to a third position comprising an unstable S-shape condition; and output signal means engageable by said actuator and including snap-action switch means responsive to snap action movement of said actuator into said S-shape condition for operating from a first electrical posture to a second electrical posture, said actuator being movable from said unstable S-shape condition to said stable arcuate condition responsive to a predetermined lower pressure acting on said diaphragm.

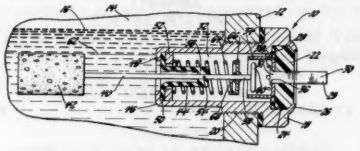
3,890,478
LIQUID LEVEL SENSOR

John W. Riddel, Fenton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 7, 1973, Ser. No. 413,448
Int. Cl. H01h *35/18*
U.S. Cl. 200—84 R **2 Claims**

1. A liquid level sensor for a fluid containing tank comprising: a base member adapted to be supported by a tank wall; an insulating member supported by said base; a terminal member extending through said insulating member and having a first end portion extending outside the tank wall and adapted to be connected to an external low level indicator and a second end portion on an opposite side of said insulating member; an arm extending from said base member into said tank interior; float means in said tank interior attached to one end of said arm to produce movements of said arm in response to

changes in the liquid level in the tank; a coil spring with a first end attached to said base member and a second end within the tank and operably supporting said arm to provide a resilient connection between said base member and said arm whereby movement of said float means due to a predetermined drop in the liquid level causes said arm to laterally deflect the second



end of said spring in one direction and thereby cause movement of the other end of said arm in a second opposite direction; cup-shaped contact means supported between the second end portion of said terminal member and the other end of said arm for making an electrical connection therebetween by contact with the inner cylindrical surface of the contact.

3,890,479

FAST CUT-OUT PNEUMATIC SWITCH

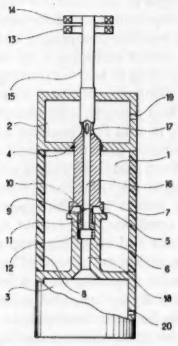
Edmond Thuries, Pusignan, and Francois Joly, Lyon, both of France, assignors to Delle-Alsthom, Villeubanne, France

Filed Dec. 20, 1972, Ser. No. 316,783

Claims priority, application France, Dec. 21, 1971, 71.46011

Int. Cl. H01h *33/42*

U.S. Cl. 200—148 BV **2 Claims**



1. In a pneumatic switch comprising a cut-out chamber containing a compressed gas and, in that chamber, a set of contacts whose moving contact is installed on a moving rod crossing through a wall of said chamber, the improvement wherein: said moving rod is hollow at least throughout the whole of its length entering said chamber, the inside of said rod communicating, through an opening placed in the portion of the rod outside said chamber, with a low-pressure medium, the body of a valve being installed round the moving contact which, when the switch is in the closed position, is closed and separates the inside of the said rod from the compressed gas contained in the said chamber, electrodynamic means being placed on the outstide of said chamber in juxtaposition to said rod and acting directly thereon to cause, when they receive, a current emission, the initiation of movement of said moving rod, and subsequently, the opening of said valve, this causing the accelerated continuance of the opening movement of said moving rod under the action of the compressed gas contained in said chamber, said chamber including a hollow body, defining said seat, said fixed contact being fitted within an opening within said seat with said seat opening leading outside said chamber, to a low-pressure medium, said cut-out chamber consisting of a first cylinder, said hollow body consisting of a second cylinder having the same axis and being of smaller diameter, said second chamber leading at said first end into said chamber, and a cylindrical tank which communicates with the outside atmosphere through an orifice having a small cross section and into which the second end of said second cylinder leads and being arranged at the end of said first cylinder, on the output side of said hollow body.

3,890,480

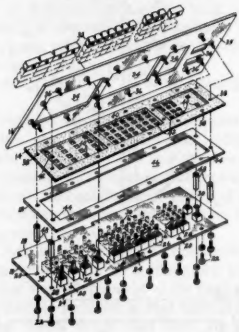
HERMETIC SEALING STRUCTURE FOR ELECTRONIC KEYBOARD APPARATUS

David Thomas Berling, and John William Chaney, both of Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed May 23, 1974, Ser. No. 472,635

Int. Cl. H01h *13/06;* **G06c** *7/02;* **B41j** *5/08*

U.S. Cl. 200—302 **4 Claims**



1. An improved electronic keyboard comprised in part of an electronic circuit board with keyboard switches connected thereto having keyboard switch bodies, keyboard switch shafts, keyboard switch shoulders and keyboard keytops; and a front cover plate attached to the board by means of spacer supports, and having openings for extension therethrough of the keyboard switch keytops; wherein the improvement comprises:

a. a shield, having a size and shape capable of encompassing all of the openings in the front cover plate, and being secured to an internal surface of the front cover plate enclosing all of the openings in the front cover plate, said shield having apertures corresponding in size, shape, and position to the keyboard switch shoulders for receiving the shoulders;

b. an adhesive coating on a surface of said shield facing away from said front cover plate for bonding said shield to the keyboard switch bodies about the keyboard switch shoulders to prevent the introduction onto the electronic circuit board of such contaminants as may pass through the front cover plate openings, while permitting the keyboard switches to operate independently from the shield; and

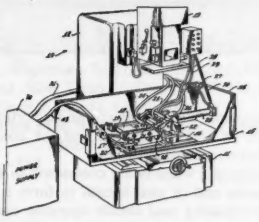
c. a retainer, having for its shape and perimeter the shape and perimeter of said shield, and cooperating with the spacer supports for clamping said shield between said retainer and the front cover plate, thereby securing said shield to the internal surface of the front cover plate

about the periphery of said shield and enclosing all of the openings in the front cover plate.

3,890,481
ELECTROEROSIVE PROCESS FOR MANUFACTURING ROTARY DIES

Homer G. Buck, Los Angeles, Calif.

Continuation of Ser. No. 16,620, Oct. 10, 1969, which is a division of Ser. No. 712,247, March 11, 1968, Pat. No. 3,542,993. This application Feb. 22, 1972, Ser. No. 228,205
Int. Cl. B23p *1/08, 1/04*
U.S. Cl. 219—69 M 10 Claims



1. A method of manufacturing a rotary die from a roll that includes:

forming an electrical discharge electrode with a matrix surface that is a flat development of at least part of the shape characteristics desired to be imparted to a part, at least, of the endless surface of the roll,

mounting the electrode between a spaced pair of co-planar way surfaces in rigidly fixed spaced parallel relationship of the matrix surface to the way surfaces, and

engaging opposite ends of the roll and the way surfaces during relative movement therebetween to effect rotation of the roll to sequentially effect guided uniformly spaced registration of longitudinal traces of the surface of the roll with the matrix surface of the electrode.

3,890,482
APPARATUS FOR WELDING TOGETHER SUBSTANTIALLY VERTICALLY EXTENDING PIPE SECTIONS

Anthony J. DiBenedetto, Metairie, La., assignor to Gurtler Hebert & Co., Inc., New Orleans, La.

Continuation-in-part of Ser. No. 22,161, March 24, 1970, Pat. No. 3,727,025. This application Apr. 2, 1973, Ser. No. 346,892
Int. Cl. B23k *9/18*
U.S. Cl. 219—73 15 Claims

1. Apparatus for welding together in end-to-end relationship substantially vertically extending upper and lower pipe sections comprising:

a support ring encircling said lower pipe section and attachable thereto,

annular track means carried by said support ring,

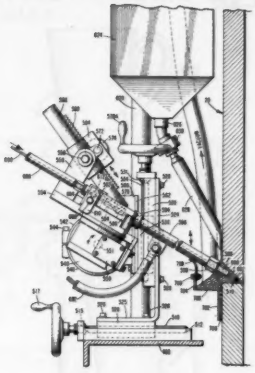
a wheeled carriage movable on said track means around said pipe sections,

carriage drive means mounted on said carriage for moving said carriage around said track means,

welding electrode radial positioning means mounted on said carriage for positioning said welding electrode generally radially with respect to said pipe sections, said radial positioning means comprising a radial slide movable generally radially of said pipe sections in a plane generally perpendicular to the axis of said pipe sections and means for moving said radial slide.

welding electrode vertical positioning means for positioning said welding electrode vertically with respect to said pipe sections, said welding electrode vertical positioning means being mounted on said radial slide and comprising a vertical slide movable generally parallel to the axis of said pipe sections and means for moving said vertical slide,

welding electrode vertical attitude positioning means for establishing the angular position of said welding electrode with respect to a plane perpendicular to the axis of said pipe sections, said welding electrode vertical attitude positioning means being mounted on said vertical slide and comprising a wire feed motor having a drive shaft,



wire feed motor bracket means rotatably holding said wire feed motor to permit rotative movement of said wire feed motor with respect to said wire feed motor bracket means about the axis of said drive shaft, and means for rotatively positioning said wire feed motor with respect to said wire feed motor bracket means,

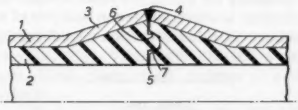
wire feed means attached to said wire feed motor and driven by said wire feed drive shaft, and

welding electrode means attached to said wire feed motor and extending toward said pipe sections.

3,890,483
JOINTS FOR PROTECTIVELY LINED OR COATED METAL PIPE SECTIONS

John David Webster, Cornwall, England, assignor to English Clays Lovering Pochin & Company Limited, England

Filed Apr. 1, 1974, Ser. No. 457,144
Claims priority, application United Kingdom, Apr. 6, 1973, 16747/73
Int. Cl. B23k *9/00, 11/00*
U.S. Cl. 219—92 8 Claims



1. In a method of joining a first metallic pipe section having a coating of a heat-degradable material on the inside thereof and a second metallic pipe section along abutting metal edges by forming a welded joint between the abutting metal edges of the metallic pipe sections, the improvement which comprises before forming said welded joint inserting between the first metallic pipe section and the coating on the inside thereof along the edge which is to be welded to the second metallic pipe section a quantity of material which substantially pre-

vents heat being transferred from the welded joint, during the formation thereof, to the coating in an amount sufficient to cause degration of the coating.

3,890,484

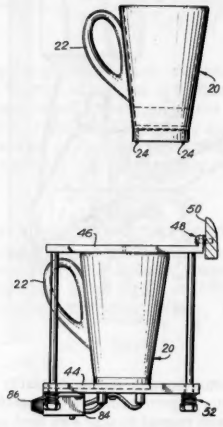
BEVERAGE-HEATING DEVICE

Jerome H. Kamins, 1036 Mayfair Rd., Baldwin, N.Y. 11510; Michael I. Mandell, 15 Westland Dr.; Harry Armen, Jr., 27 Jefferson St., both of Glen Cove, N.Y. 11542, and Paul Savet, 505 Alica Dr., Westbury, N.Y.

Filed June 4, 1973, Ser. No. 366,483

Int. Cl. F27d *11/02*

U.S. Cl. 219—432 **9 Claims**



1. For use in the preparation of a heated liquid, a container made of an electrically non-conductive material, an electrically conductive heating wire embedded in a wall portion of the container between inner and outer surfaces of said wall portion, said heating wire having a pair of opposed ends exposed at the exterior of the container to form a pair of contacts to be connected to a source of current for energizing the heating wire to heat a liquid situated in the container, said contacts being situated at the bottom of the container, an electrically non-conductive base means supporting said container during the heating thereof, said base means carrying a pair of electrodes which engage said contacts, electrically conductive means connected to said electrodes for connecting the latter to a source of electricity, plate means situated over said base means and engaging the top of the container so that said base means and plate means form a pair of means between which said container is located during heating of the container, and spring means operatively connected with one of said pair of means for urging the latter toward each other when said container is situated between said pair of means, so that the container is clamped between said pair of means during heating of the container.

3,890,485

ELECTRIC HEATERS

Lloyd S. Kozbelt, Pittsburgh, Pa., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 29, 1974, Ser. No. 456,014

Int. Cl. H05b *3/80, 1/02*

U.S. Cl. 219—523 **5 Claims**

1. An electric heater, comprising:

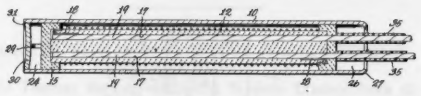
a tubular metal sheath,

electrical-insulating, heat-conducting material transversely filling said sheath and extending for substantially the length thereof,

a heating resistance wire extending longitudinally of said sheath and through said material,

a pair of thermocouple wires of dissimilar metals extending longitudinally of said sheath and through said material in laterally spaced relation with respect to said resistance wire,

said material electrically insulating said resistance wire and said thermocouple wires from each other and said sheath, terminal means extending from said resistance wire and outwardly of one end of said sheath for connection to a source of electricity for energizing said resistance wire to produce heat,



said thermocouple wires having terminal portions extending outwardly of said sheath one end for connection to a temperature responsive device,

said thermocouple wires being connected to each other at the opposite end of said sheath to form a heat sensing junction adjoining said sheath opposite end and be responsive to thermal conditions thereat, but being disposed within the transverse confines of said sheath opposite end for protection,

a metal disc hermetically closing said opposite end of said sheath, the inner wall surface of said disc being disposed adjacent to said heat sensing junction, and,

said thermocouple wires are connected to each other through said metal disc.

3,890,486

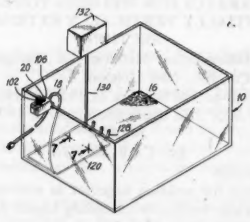
AQUARIUM-TANK HEATING CONTROL

Robert C. Fitzgerald, High Falls, N.Y., assignor to Equipment Development Corporation, New Canaan, Conn.

Continuation of Ser. No. 356,224, May 1, 1973, abandoned. This application Sept. 18, 1974, Ser. No. 507,075

Int. Cl. H05b *3/06*

U.S. Cl. 219—523 **11 Claims**



1. A heating device comprising resistive heating element means for heating a first region; temperature control means positionable in a second region spaced from said first region for controlling the temperature at which said first region is maintained by said resistive heating element means; and electrical cable means extending between said resistive heating element means and said temperature control means for applying current to said resistive heating element means, said temperature control means being adapted to control the current applied to said resistive heating element means in response to temperature at said second region, said temperature control means including first and second contact means; first and second bi-metallic element means respectively carrying said first and second contact means in facing relation for displacement thereby into and out of engagement with each other; and a resistive member mounted in series circuit with said contact

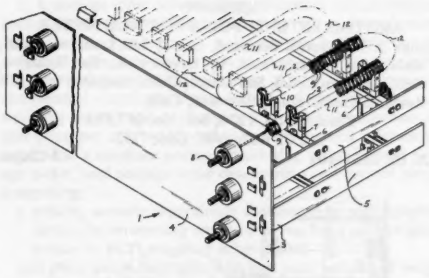
means and said resistive heating element means and positioned in proximity with a side of said first bi-metallic element means opposite to the side thereof facing said second bi-metallic element means, so that the displacement of said first contact means by said first bi-metallic element means is at least principally in response to the heat generated by said resistive member and the displacement of said second contact means by said second bi-metallic element means is at least principally in response to the temperature at said second region, said resistive heating element means including a length of resistive electrical conductor means distributed over an area; and water-proof, electrically insulating material enclosing said length of resistive electrical conductor means.

3,890,487

OPEN COIL HEATER HAVING SPACED END COILS

Lawrance W. Wightman, St. Louis; Howard C. Gebhart, Chesterfield, and Nick Tichy, Affton, all of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 4, 1974, Ser. No. 447,649
Int. Cl.[2] H05B *3/06*
U.S. Cl. 219—532 **2 Claims**



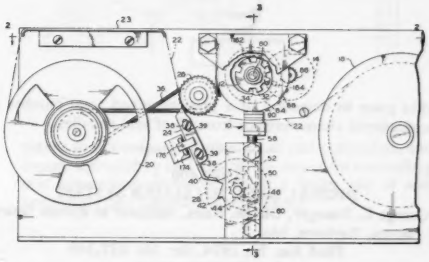
1. In an open coil heater assembly including a frame structure, means for mounting an electrical heater coil to said frame structure, and means for insulating an electrical heater coil from said frame structure, the improvement which comprises an electrical heater coil having spaced apart end turns, said electrical heater coil being formed from a plurality of spaced, continuous turns of resistance wire, said heater coil having a serpentine design including a plurality of straight conductor run portions approximately parallel to ane another, said straight conductor run portions being connected at alternate ends by a plurality of curved end portions, said curved end portions having an inner radius and an outer radius, the continuous wire turns of said straight conductor run portions and said curved end portions being stretched during the manufacture of said electrical heater coil in a direction approximately corresponding to the longitudinal axis of said straight conductor run portions so as to impart a first permanent set to said coil, and to provide a spacing between successive wire turns of said straight conductor run portions, the wire turns of said curved end portions further being stretched in a direction approximately corresponding to a radius about which said curved end portions are formed in said respective design so as to impart a second, additional permanent set to the curved end portions of said heater coil and provide a spacing between successive wire turns of said curved end portions, the spacing of the turns of said curved end portions, measured. along the inner radius of said curved end portions, being approximately equal to the spacing between the turns of said straight conductor run portions along at least one point of each turn of said coil throughout the length of each of said straight conductor run portions and said curved end portions forming said heater coil, said first and said second permanent sets maintaining said heater coil in said serpentine design before placement in said electrical heater assembly, said mounting means holding said heater coil against movement after placement of said heater coil in said electrical heater assembly.

3,890,488

DIGITAL PRINT AND PUNCH TAPE RECORDER HAVING READ-WRITE MEMORY

Harold G. Lee, and Henry O. Peterson, both of Portland, Oreg., assignors to Leupold & Stevens, Inc., Beaverton, Oreg.

Filed Dec. 5, 1973, Ser. No. 421,826
Int. Cl. G06k *1/05;* **H04l** *15/32;* **B44b** *5/00*
U.S. Cl. 235—61.9 A **21 Claims**



15. A printed and punched tape recorder in which the improvement comprises:

input means for supplying input data as electrical input signals;

electronic memory means for receiving and storing a plurality of data input signals supplied thereto by said input means, and for producing a digital data output signal corresponding to the stored data input signals;

punch means for punching a tape with holes arranged in a digital code to provide a punched number corresponding to said digital data output signal;

print means for printing a number on said tape coresonding to said punched number; and

control means including an actuator motor connected to the output of said memory means for operating said punch means and said print means, said motor being energized in response to said digit data output signal.

3,890,489

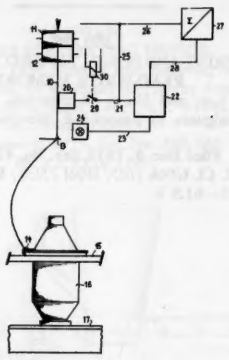
METHOD OF AND APPARATUS FOR ASSESSING THE RUNNING BEHAVIOR OF TEXTILE MACHINES

Ernst Felix, Uster, Switzerland, assignor to Zellweger, Ltd., Switzerland

Filed Jan. 24, 1973, Ser. No. 326,521
Claims priority, application Sweden, Jan. 24, 1972, 972/72
Int. Cl. G06m *3/02*
U.S. Cl. 235—92 PD **8 Claims**

1. A method of assessing the running behavior of a textile machine including a plurality of spindles comprising the steps of detecting operational characteristics at each individual spindle, counting the detected operational characteristics at each spindle, summing the detected operational characteristics from all of said spindles and generating a signal in the immediate proximity of each spindle when the number or duration of the characteristics detected at the given spindle

reaches a predetermined value in excess of the average number of detected operational characteristics of the plural spin-



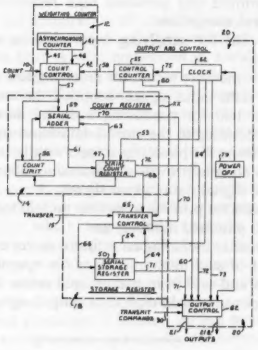
dles prior to detection of a predetermined total number of operational characteristics from all of said spindles.

3,890,490

DIGITAL DATA TOTALIZER SYSTEM

George L. Buenger, Olathe, Kans., assignor to Rycom Instruments, Raytown, Mo.

Filed Jan. 28, 1974, Ser. No. 437,340
Int. Cl. H03k 21/08
U.S. Cl. 235—92 TF **25 Claims**



1. A digital pulse counter and encoder device having at least one input and at least one output, the device operable to parameterize primary pulses appearing at said input in binary form, the device comprising:

a weighted gate register means having a first input and second input and a first output and a second output therefrom, said first input being interconnected with said primary pulses to be counted at said input to said device, said second input being interconnected with a second source of pulses at the input to said device, said weighted gated register means functioning to produce serial binary data on an output thereof that correlates to a number of counted pulses being inputted to said device;

means for continuously recirculating said serial binary data when a primary pulse does not occur during a predetermined register cycle;

a memory means for storing said binary data, said memory means having an input and an output;

means interconnecting said first output of said weighted gated register means having said serial binary data thereon with said memory means input in response to said second source of pulses;

an output control means for converting input data to an output signal suitable for transmission over a communications link, said output control means having a first, second and third input and an output to said communications link, means interconnecting said first output control input with said memory means output;

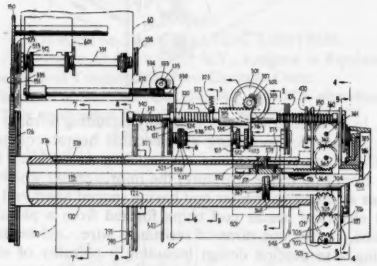
means interconnecting said second output control input with said second output from said weighted gated register means, said output control means thereby functioning to effect the transmission of data on the control means output communications link that appears on one of said first and second control means inputs, said transmission occurring upon a preselected condition appearing on said third output control means input and corresponding to the number of primary pulses appearing at the input to said device and the elapsed time between said primary pulses.

3,890,491

ARITHMETIC UNIT FOR A POSTAGE METER

Arthur J. Malavazos, deceased, late of San Leandro, Calif.; Malavazos, administrator, by Gregory A., San Leandro, Calif., and Jan Urdal, San Mateo, Calif., assignors to A J M Research Corporation, Hayward, Calif.

Filed Apr. 3, 1974, Ser. No. 457,592
Int. Cl. G07g 1/00; G06c 7/02
U.S. Cl. 235—101 **3 Claims**



1. An arithmetic and printing unit for a postage meter comprising:

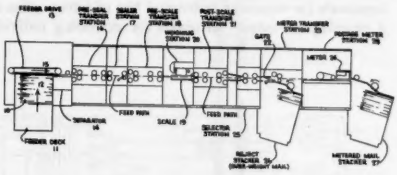
1. a cylindrical hollow main drive shaft;
2. means for mounting said drive shaft for rotation;
3. means for cyclically rotating said drive shaft;
4. an ascending register and a descending register;
5. a print head mounted on said drive shaft;
6. a manually operative selection mechanism for selecting values to be registered in said registers and in said print head;
7. a mutilated drum actuator for one of said registers mounted on said drive shaft;
8. means controlled by said selection mechanism for operating one of said registers from said actuator differentially from the value set in said selection mechanism;
9. a second mutilated drum actuator;
10. means driven by said main drive shaft for driving said second mutilated drum actuator;
11. means controlled by said selection mechanism for registering a value in said second register from the operation of said second actuator;
12. value stamping members for printing a stamp value on mail matter positionably mounted within said print head; and

13. means controlled by said selection mechanism for positioning said stamping members.

3,890,492
POSTAGE VALUE DETERMINING AND CONTROL CIRCUIT

Flavio M. Manduley, Seymour, Conn., and Anthony Storace, Tarrytown, N.Y., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed June 5, 1974, Ser. No. 476,682
Int. Cl. G06f *15/20;* **G01g** *23/42*
U.S. Cl. 235—151.33 **4 Claims**



1. A postage value determining and control circuit interconnected between a weighing device having a photodetector bank for supplying weight pulse signals indicative of the weight of a piece of mail, and a postage meter for imprinting a postage value upon weighed pieces of mail, said determining and control circuit receiving weight information from said weighing device, and performing a multiplication between a unit price per unit weight value and said weight information to provide a resultant postage imprinting value for said postage meter, said postage value determining and control circuit comprising:

a priority encoder operatively connected to said weighing device for converting weighing pulses from said weighing device to BCD weighing information;

unit price means for supplying a unit price per unit of weight value;

converting means operatively connected to said unit price means for converting said unit price per unit of weight value to unit price BCD information;

adder means operatively connected to said converting means for receiving said unit price BCD information and adding said unit price BCD information a plurality of times equal to the BCD weighing information so as to effect a multiplication between the unit price per unit weight value and said weight information, thereby providing a postage imprinting value for said postage meter; and control means including an up-down counter operatively connected to said adder means for controlling the addition of the adder means, the up-down counter operatively connected to said encoder for counting down a number of times corresponding to the BCD weighing information, and upon reaching a zero count condition, halting further addition in said adder means.

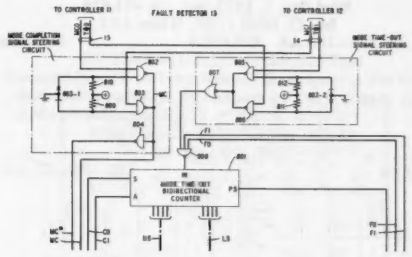
3,890,493
CIRCUITRY FOR DETECTING FAULTS IN DUPLICATE CONTROLLERS

Richard Duane Burtness, Boulder, Colo.; Garry Carson Hess, Champaign, Ill., and Bliss D. Jensen, Boulder, Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 21, 1974, Ser. No. 453,351
Int. Cl.[2] G06F *11/00*
U.S. Cl. 235—153 AE **17 Claims**

1. Fault detector circuitry for first and second system controllers and means alternately connecting each one of said controllers individually to peripheral system circuits at prescribed intervals for active and standby control of system operation, said detector circuitry comprising

means for decrementally and incrementally counting trouble signals from connected active ones of said controllers, means responsive to said counting to prescribed decremental and incremental count states of said counting

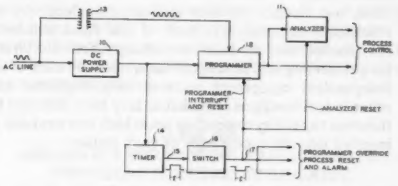


means for identifying a faulty one of said controllers, and means activated by said identifying means for controlling said connecting means to switch a faulty one of said controllers into a standby control state.

3,890,494
APPARATUS AND METHOD FOR ALTERING PROCESS CONTROL IN RESPONSE TO A POWER INTERRUPTION

Harry M. Meshek, Bartlesville, and Vern A. Street, Tulsa, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 28, 1974, Ser. No. 455,738
Int. Cl. G05b *19/00*
U.S. Cl. 235—153 R **18 Claims**



1. Apparatus for altering a process control system in response to an interruption in the supply of electrical power to said process control system, said apparatus comprising:

a timing means having trigger input means for accepting a preselected trigger signal and timed output means for producing a timed output signal of preselected duration in response to said preselected trigger signal,

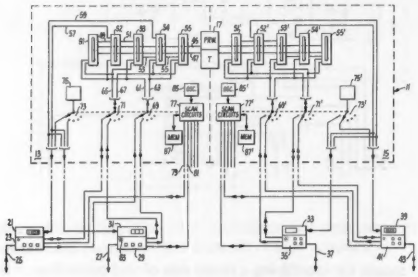
trigger signal generatng means for sensing an interruption in power provided by a first power supply means to said process control system and generating said preselected trigger signal in response to the termination of said interruption, and

process control system override means for overriding at least a portion of said process control system in response to, and for the duration of, said timed outpt signal.

3,890,495
TELEPHONE SYSTEM TESTING APPARATUS AND TECHNIQUES UTILIZING CENTRAL MEASURING EQUIPMENT WITH A PLURALITY OF REMOTE TEST STATIONS

Paul R. Bauer, Palo Alto, and Duane E. Dunwoodie, Los Altos, both of Calif., assignors to Wiltron Company, Palo Alto, Calif.

Filed Nov. 1, 1973, Ser. No. 411,818
Int. Cl. G06f *11/00*; H04m *3/22*
U.S. Cl. 235—153 AK **18 Claims**



1. In a testing system having a capability of conducting a plurality of functional tests to determine a number of parameters of an electronic circuit, said testing system including means for connection to a circuit to be tested, means for displaying said circuit parameters, and means for controlling the test activities being conducted on the circuit, an improvement wherein a modular system for selecting and implementing said functional tests is employed which comprises at least two substantially identical but independent modular equipment sections, each of said sections comprising:

a fixed number of receptacles having separate electrial contacts for connection to said circuit means, to said display means, to said control means and to contacts of other receptacles for some interconnection therebetween, and

at least two distinct modules uniquely, mechanically and electrically acceptable to each of said fixed number of receptacles, said modules containing electronic circuits for performing said functional tests, whereby each of said independent equipment sections may duplicate each other in test functions provided or may have different test function capability depending upon hich test modules are inserted into the receptacles of each station.

3,890,496
VARIABLE 8421 BCD MULTIPLIER

Julian T. Hartzog, Clearwater, Fla., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 1, 1974, Ser. No. 456,999
Int. Cl. G06f *7/52*
U.S. Cl. 235—159 **7 Claims**

1. An 8421 BCD digital multiplier comprising

matrix means,

means for applying multiplicand and multiplier input signal bits in the 8421 BCD format to the matrix means,

a plurality of dual input gating means in said matrix means, each gating means being connected to receive a different combination of single multiplicand and single multiplier signal bits, each of said gating means providing an individual signal when both of its input terminals are energized, said individual signals being assigned a numerical value equal to the product of the numerical values of the single signal bits applied to the input terminals of that gating means,

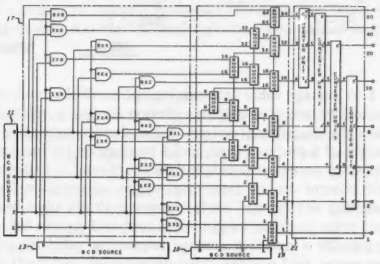
means to receive carry signal bits in the 8421 BCD format, an adder bank,

means in said adder bank for adding individual signals of like numerical value from said matrix means to individual simultaneously received carry signal bits of like numerical value,

said adder bank having a plurality of output terminals for providing intermediate output signals comprised of individual bits having assigned values arranged in the binary format,

data conversion means including a series of connector units for converting the binary output signals from said adder bank into output signal bits in the 8421 BCD format,

each of said converter units including a plurality of input terminals for receiving individual bits of information and a plurality of output terminals for providing individual



output bits in a given decade of the 8421 BCD format, plus a carry bit in the next higher decade of the same format,

said series of converter units being arranged in a stepped fashin in which the first unit in said series is connected to receive a group of the highest valued bits from said adder bank and each succeeding converter unit is connected to receive all bits except the carry bit from the preceding converter unit as well as the next lower valued bit from the adder bank,

the carry bit output terminal on each of said converter units being connected directly to an individual output terminal of the digital multiplier,

the output terminals on the last unit in said series being connected directly to an individual output terminal of the digital multiplier.

3,890,497
ILLUMINATED SAFETY POLE FOR BICYCLES OR THE LIKE

David H. Rush, Belle Harbor, N.Y., assignor to Chromalloy Electronics Div. Chromalloy American Corp., Hollywood, Fla.

Filed Mar. 18, 1974, Ser. No. 451,741
Int. Cl. F21g *1/00*
U.S. Cl. 240—7.55 **11 Claims**

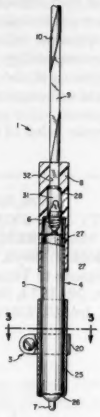
1. An illuminated warning device for bicycles or the like comprising:

a transparent light pipe in the form of an elongated pole;

a light source adjacent one end of said pole for introducing light into said light pipe for passage along the length thereof; and

material partially covering the outer surface of said light pipe for causing light within said pipe to be emitted

through the side wall thereof opposite said material, said material being positioned intermediate the ends of said



light pipe and the side of said pipe opposite said material being uncovered.

3,890,498

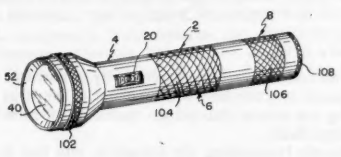
FLASHLIGHT DEVICE

Paul D. Toth, Sr., 12712 W. 13th St., Cleveland, Ohio

Continuation of Ser. No. 208,866, Dec. 16, 1971, abandoned. This application Oct. 1, 1973, Ser. No. 402,135

Int. Cl. F21v *1/00*

U.S. Cl. 240—10.66 **13 Claims**



1. A flashlight device having a rugged, high strength construction for use as both a flashlight device and a working tool or hand weapon comprising:

a body member having an elongated, generally cylindrical configuration and opposed front and rear ends, said body member including an elongated cylindrical passageway for receiving an electrical battery cell therein and said rear end including first thread means;

a light assembly connected to the front end of said body member;

switch means slidably mounted on said body member between its opposed front and rear ends for selectively electrically connecting a battery cell within said passageway to said light assembly and selectively energizing said light assembly;

a rear cap assembly having complementary thread means detachably connected to the rear end of said body member, said rear cap assembly including,

a rear cap member including a base, a forwardly extending, shank-like flange and a generally centrally disposed aperture extending therethrough, said flange including said complementary thread means and defining an interior compartment-like recess therewithin, said aperture including an internal thread means,

a fastener element including an externally threaded end threadably engaged within said aperture and a transversely apertured end,

a carrying element extending through said transversely apertured end,

whereby said fastener element may be alternatively disposed in a first orientation with the threaded end threaded into said aperture with the carrying element disposed outside the cap assembly and in a second orientation with the carrying element disposed in said recess inside said cap assembly to permit convenient storage of said carrying element.

3,890,499

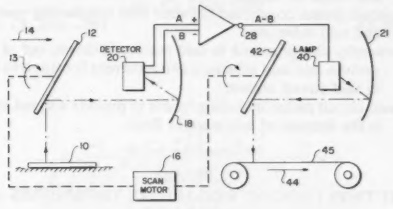
DIFFERENTIAL SCANNER SYSTEM

Bernard Lippel, West Long Beach, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 15, 1970, Ser. No. 48,617

Int. Cl. H01j *39/12*

U.S. Cl. 250—201 **4 Claims**



1. A dual scanner comprising means for scanning an object emitting electromagnetic radiation, a first detector responding to the electromagentic radiation emitted from each scanned element of said object, and a second detector responsive to radiant energy emanating from a background surrounding said element said first and second detectors providing electrical signals, circuit means for subtracting an electrical signal from said second detector from an electrical signal from said first detector to provide a difference signal, means for separately recording said difference signal and said signal from said second detector on separate recording means, separate means for playing back said separately recorded signals, means for combining said separately played back signals, said combined signal being applied to an energy source to modulate the intensity thereof, and means including a scanner device synchronized with said scanning means for directing said energy onto a recording device.

3,890,500

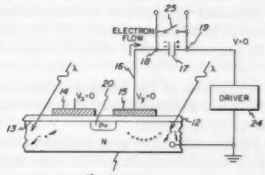
APPARATUS FOR SENSING RADIATION AND PROVIDING ELECTRICAL READOUT

Charles W. Eichelberger, Schenectady; William E. Engeler, Scotia, and Jerome J. Tiemann, Schenectady, all of N.Y., assignors to General Electric Company, Schenetady, N.Y.

Filed Feb. 11, 1974, Ser. No. 441,054

Int. Cl. H01j *39/12*

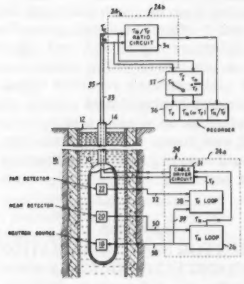
U.S. Cl. 250—211 J **17 Claims**



1. A radiation sensing device comprising

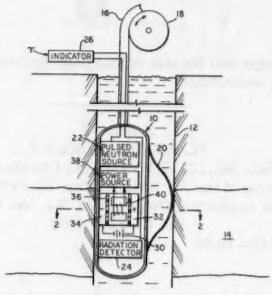
a substrate of semiconductor material of one conductivity type having a major surface,
a conducting member overlying a portion of a region of said substrate adjacent said major surface and in insulating relationship therewith,
a voltage means connected in circuit between said conducting member and said substrate for providing a voltage of one value between said conducting member and said substrate to deplete said portion of majority charge carriers,
said substrate being maintained at a fixed potential in relation to said one value of voltage,
means for exposing said substrate to radiation whereby minority carriers generated in said portion are stored therein,
means for collapsing said voltage to another value for an interval of time to inject said stored carriers into said substrate and thereafter reestablishing substantially said one value of voltage,
circuit means connected between said conducting member and said substrate,
whereby charge stored in said portion is driven out of said portion into said substrate and a current is caused to flow in said circuit means,
said circuit means including means to provide a signal which is the integral of said current flow.

3,890,501
NEUTRON LOGGING RELIABILITY TECHNIQUES AND APPARATUS
Charles Wilkin Johnstone, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.
Filed May 1, 1973, Ser. No. 356,150
Int. Cl. G01v *5/00*
U.S. Cl. 250—265 **47 Claims**



1. A method for providing verifiably accurate logging data derived at least in part by neutron logging of earth formation characteristics, comprising the steps of:
irradiating an earth formation with discrete pulses of high-energy neutrons to produce therein between pulses a population of neutrons, the decay of which is functionally related to intrinsic neutron characteristics of the formation;
detecting indications of the neutron population in the formation between neutron pulses at a first location spaced from the neutron source;
deriving a representation of an apparent value of a selected one of said neutron characteristics corresponding to the detected indications at the first location;
detecting indications of the neutron population in the formation between neutron pulses at a second location spaced from the first location and from the neutron source; and
combining said first location apparent value representation and a function of said second location detected indications to derive a representation functionally related to a quotient of the apparent values of said selected neutron characteristic corresponding to the detected neutron population indications at the first and second locations, thereby to provide information as to the validity of said first location apparent value representation as a measurement of the intrinsic value of said selected neutron characteristic.

3,890,502
PERMEABILITY LOG USING NEW LIFETIME MEASUREMENTS
Donald J. Dowling; John F. Boyd, and James A. Fuchs, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.
Filed Dec. 20, 1973, Ser. No. 426,873
Int. Cl. G01t *1/00*
U.S. Cl. 250—267 **15 Claims**

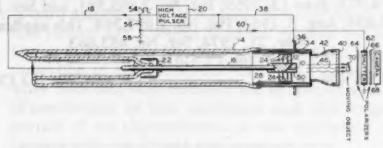


1. A method of measuring permeability of an earth formation adjacent to a borehole which comprises the steps of
altering the natural charged ion spatial distribution in formation fluids;
repetitively bombarding the formation with fast neutrons from a pulsed neutron source to create a cloud of thermal neutrons in the formation;
measuring a thermal neutron decay time characteristic of the earth formations during said altered spatial distribution of charged ions;
measuring a thermal neutron decay time for some earth formation having an unaltered spatial distribution of charged ions; and
comparing the two measures to obtain an indication of formation permeability.

3,890,503
STIMULATED EMISSION LIGHT SOURCE PUMPED BY ELECTRON BEAM OF FIELD EMISSION INITIATED VACUUM ARC
John L. Brewster, McMinnville, Oreg., assignor to Hewlett Packard Company, Palo Alto, Calif.
Continuation of Ser. No. 779,978, Nov. 29, 1968, abandoned.
This application May 28, 1971, Ser. No. 148,163
Int. Cl. G01m *23/04*
U.S. Cl. 250—321 **10 Claims**

1. Apparatus for generating high intensity light pulses comprising:
light source means including particulate light emitting material capable of producing light by stimulated emission of radiation, said light emitting material being supported on an electrically conductive support member;

an evacuated envelope containing no appreciable free gas;
means for mounting said light emitting material outside said envelope;
electron pumping means including an anode, and a field emission cathode having at least one sharpened emitting element mounted within said envelope, for emitting a beam of electrons through the anode to the exterior of the envelope and for bombarding the light emitting material with said electrons to cause said material to emit light; and



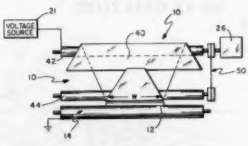
pulser means for applying narrow electrical pulses between said cathode and said anode which are each of sufficiently high voltage and high current to cause the field emission of electrons from the cathode emitting element and evaporation of a portion of said emitting element to form free ions of cathode material which produce a vacuum arc within the envelope, said vacuum arc causing an extremely high electron beam current to flow from said cathode to the particles of light emitting material so that a light pulse of high intensity is emitted by stimulated emission of radiation from said material.

3,890,504

ADJUSTABLE CORONA DISCHARGE ELECTRODE

Pyam Pendleton, and Myron R. Waldman, both of Warwick, R.I., assignors to Walco Systems, Inc., Providence, R.I.

Continuation of Ser. No. 336,203, Feb. 27, 1973, abandoned. This application Mar. 15, 1974, Ser. No. 451,570
Int. Cl. G03g *15/00*
U.S. Cl. 250—325 **9 Claims**



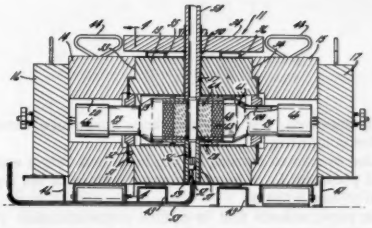
1. An electrode assembly for use in the electrical surface treatment of a material comprising,
a first elongated electrode having a longitudinal dimension,
a second electrode provided by an electrically conductive surface, said surface being of varying width from one end to the other of the length thereof,
means having a longitudinal dimension for positioning a portion of said second electrode surface spanning a selected width thereof in juxtaposition to a longitudinal surface of said first electrode,
said longitudinal dimension of said first electrode and said longitudinal dimension of said positioning means being in substantially parallel spaced relationship to one another to provide juxtaposed surfaces of said first and second electrodes of length equal to said selected width of said second electrode surface,
means for actuating said positioning means to move said second electrode surface relative to said first electrode from one position to another position in the direction of the length thereof, perpendicular to the longitudinal dimension of said first electrode, to change said portion of the second electrode surface juxtaposed to said longitudinal surface of said first electrode, and
means for applying a voltage across said electrodes,
whereby upon passing a material to be treated between said juxtaposed first and second electrode surfaces in a direction perpendicular to said selected width while an electrical voltage is applied between said electrodes, a corona discharge takes place between said second electrode and said material.

3,890,505

SCINTILLATION COUNTER; PHOTOMULTIPLIER TUBE ALIGNMENT

Robert E. Olson, Glen Ellyn, Ill., assignor to Packard Instrument Company, Inc., Downers Grove, Ill.

Filed July 27, 1973, Ser. No. 383,061
Int. Cl. G01t *1/20*
U.S. Cl. 250—361 **3 Claims**

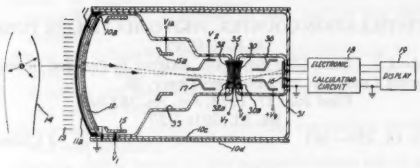


1. In a scintillation counter having
a massive lead radiation shield,
a sample-receiving zone within said shield,
a horizontal photomultiplier tube-housing bore in said shield and extending at least to said sample-receiving zone,
at least one photomultiplier tube assembly in said bore responsive to light scintillations produced from radiation emitted by said sample, said photomultiplier tube assembly being rotatable and longitudinally moveable in said bore, and
a sample transfer bore extending radially between said receiving zone and an outer side of said shield for permitting the passage of said sample therethrough
the improvement whereby said photomultiplier tube assembly is alignable both longitudinally and perpendicularly with respect to said sample trnasfer bore, comprising:
a sample conducting tube slidably disposed in said transfer bore with an end thereof extending partially into said sample-receiving zone, said sample conducting tube end having a flat end face, and
said photomultiplier tube assembly having a flat longitudinal outer surface adapted for movement adjacent said tube end face upon longitudinal positioning of said photomultiplier tube assembly relative to said horizontal bore, said photomultiplier tube assembly having an outwardly projecting stop portion at an end of said flat surface for engaging said sample conducting tube end to establish an exact longitudinal position of said photomultiplier tube relative to said sample-receiving zone.

3,890,506
FAST RESPONSE TIME IMAGE TUBE CAMERA

Walter H. Berninger, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 15, 1973, Ser. No. 416,222
Int. Cl. G01t 1/00
U.S. Cl. 250—370 14 Claims



1. An improved, fast response time, image-tube camera apparatus comprising

a sealed evacuated housing having input and output ends,

a first phosphor layer formed along a surface of the input end of said housing,

a first photocathode film in optical communication with said first phosphor layer and disposed inside said housing adjacent and along the input end thereof, said first phosphor layer producing a pulse of light in response to an absorbed incident nuclear particle or ray of electromagnetic radiation generated external of said housing, the number of optical photons in each light pulse being proportional to the energy of the absorbed incident ray or particle, said photocathode film detecting the optical photons and emitting electrons in response thereto,

a second phosphor layer disposed inside said housing between said first photocathode film and the output end of said housing and positioned generally normal to the paths of the electrons emitted by said first photocathode film and beyond the cross-over point thereof,

a second photocathode film in optical communication with said second phosphor layer and disposed inside said housing between said second phosphor layer and the output end of said housing so that the apparatus comprises a dual-stage image intensifier,

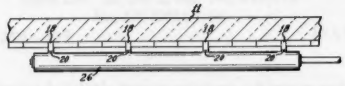
semiconductor dual-axis position sensor means positioned within said housing adjacent the output end thereof for detecting electrons emitted from the second photocathode film and producing electrical signals from which the dual-axis coordinates of the second photocathode-emitted electrons impacting on said semiconductor means and the corresponding incident ray or particle can be determined, the number of impacting electrons being derivable from the output of said semiconductor means and being proportional to the energy of the incident ray or particle, and,

means for accelerating the electrons emitted from said second photocathode film and for focussing them on said semiconductor means to cause high energy pulsed electron excitation thereof so as to provide a substantial quantum gain over the conventional low energy light photon excitation thereof and so obtain improved image quality and faster response time thereover.

3,890,507
CATHODE RAY TUBES WITH TARGET SCREENS AND MANUFACTURE THEREOF

David M. Goodman, 3443 Debra Ct., Seaford, N.Y. 11783

Division of Ser. No. 63,331, Aug. 12, 1970, Pat. No. 3,801,817, which is a division of Ser. No. 772,639, Nov. 1, 1968, Pat. No. 3,598,628, which is a continuation-in-part of Ser. Nos. 488,017, Sept. 17, 1965, Pat. No. 3,564,121, Ser. No. 345,197, Feb. 17, 1964, and Ser. No. 85,353, Jan. 27, 1961, Pat. No. 3,691,424, which is a division of Ser. No. 800,854, March 20, 1959, Pat. No. 3,081,414, which is a continuation-in-part of Ser. No. 522,609, July 18, 1955, Pat. No. 2,897,388, Ser. No. 514,973, June 13, 1955, Pat. No. 2,885,591, and Ser. No. 488,039, Aug. 5, 1954, Pat. No. 2,897,398. This application Mar. 21, 1974, Ser. No. 453,663
Int. Cl. G01t 1/20
U.S. Cl. 250—483 13 Claims

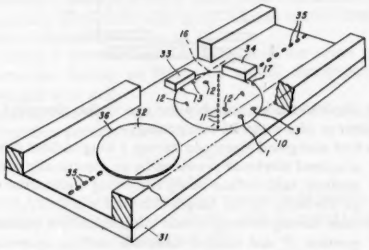


1. A beam-index line-screen color kinescope with an electron gun for providing a scannable electron beam, a target screen, and a transparent faceplate; said target screen comprising a first layer of different color producing elements arranged in a line-like mosaic pattern on the interior side of the faceplate in register with a line-like pattern of index signal generating elements which furnish optical index signals indicative of the position of impact of the scanning beam on the target screen; including light pipe means for transmitting said optical index signals transversely of the faceplate to an exit terminalwhere they are to be used for indexing purposes; said target screen also having a second layer of electrically conductive material disposed on the first layer on the side thereof away from the faceplate.

3,890,508
WORKPIECE ALIGNMENT SYSTEM

Mark Edward Sharp, Oklahoma City, Okla., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 28, 1973, Ser. No. 429,334
Int. Cl. G01n 21/30
U.S. Cl. 250—548 3 Claims



1. A system for positioning and aligning a circular workpiece having an irregular circumference at one region along its circumference comprising in combination:

a. a pair of stop members, and

b. a body,

c. said stop members being so positioned relative to said body as to position a workpiece on said body when both of said stop members are in contact with the circumference of said workpiece and in a desired aligned position only when the irregular portion of the circumference of said workpiece is in contact with one of said members,

d. said body having

i. a surface on which a workpiece is received for positioning and aligning,

ii. a plurality of fluid passages communicating with said surface and a source of pressurized fluid and being so arranged and positioned to produce an upwardly inclined and directional fluid jet flow to urge said workpiece into contact with both said stop members,

iii. a second plurality of fluid passages communicating with said surface and a source of pressurized fluid and so arranged and positioned to produce an upwardly inclined and tangential fluid jet flow to rotate said workpiece while being so urged, and

iv. a third plurality of fluid passages communicating with said surface and a source of partial vacuum and positioned to be within the circumference of the vertical projection of said workpiece on to said surface only when both said stop members are in contact with the circumference of said workpiece and said irregular portion of the circumference of said workpiece is in contact with one of said stop members,

v. a plurality of photodetector means so arranged and positioned within the circumference of the vertical projection of said workpiece on to said surface that all of said plurality of photodetector means are illuminated with actuating radiation only when said workpiece is within a given rotational angle of being in said desired aligned position,

whereby said workpiece is urged against both of said stop members and rotated toward said desired aligned position at a first rotational speed while less than all of said photodetector means are illuminated with activating radiation and at a second slower rotational speed when all of said plurality of photodetector means are illuminated with said activating radiation.

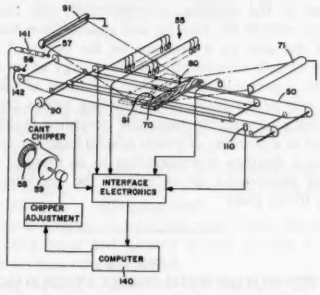
3,890,509
AUTOMATIC EDGER SET WORKS METHOD AND APPARATUS

Carl W. Maxey, Everett, Wash., assignor to The Black Clawson Company, Hamilton, Ohio

Continuation of Ser. No. 251,809, May 9, 1972, abandoned. This application Feb. 7, 1974, Ser. No. 440,505

Int. Cl. G01n *21/30*

U.S. Cl. 250—561 **11 Claims**



1. A method of scanning cants having leading and trailing wanes to obtain the maximum yield therefrom including the steps of

directing a beam of light at an angle of incidence across said cant such that a sawn portion and the trailing wane are illuminated and the leading wane is placed in shadow,

directing a second beam of light across said cant at an angle of incidence such that said sawn portion and the leading wane are illuminated and the trailing wane is placed in shadow, and

sensing the light reflected from said cant at a plurality of locations to provide information on the location of the leading and trailing edges of the cant and the leading and trailing edge of the sawn portion,

whereby the locations of the sawn portion of the cant and the leading and trailing edges of the cant are identified at said plurality of locations.

3,890,510
APPARATUS FOR CONTROLLING THE ABSORPTION OF DYE COMPONENTS IN A FLUID

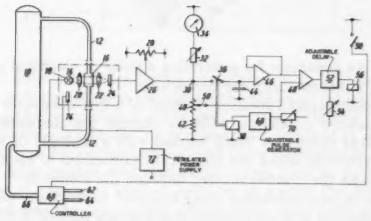
Walter H. Sturm, Hanau-Hohe Tanne, Germany, assignor to Original Hanau Quarzlampen GmbH, Hanau, Germany

Filed Nov. 30, 1973, Ser. No. 420,485

Claims priority, application Germany, Dec. 13, 1972, 2260906

Int. Cl. G01n *21/26*

U.S. Cl. 250—565 **7 Claims**



1. In an apparatus for controlling the absorption of one or more dye components contained in a dye fluid by regulating the temperature of the dye fluid depending on the transparency of the dye fluid, whereby the temperature of the dye fluid is raised to an optimum value for the absorption of a dye component as indicated by a detected change in transparency of the dye fluid and afterwards the temperature of the dye fluid is maintained at an almost constant value until the completion of the dye component absorption as indicated by a constant transparency being detected and thereafter the temperature of the dye fluid is raised to a new optimum value for the absorption of another dye component as indicated by a newly detected change in transparency of the dye fluid until all components of the dye fluid have been absorbed, said apparatus including a dye fluid container, a measuring head for measuring the transparency of the dye fluid, a shunt conduit for recirculating the dye fluid in the dye fluid container through the measuring head, and means for heating the dye fluid in the container, the improvement comprising:

a scanning circuit connected to receive a signal proportional to the transparency of the dye fluid from said measuring head, and periodically sampling said measuring head signal,

a storing circuit connected to said scanning circuit for storing samples of said measuring head signal,

a comparator having one input connected to said storing circuit,

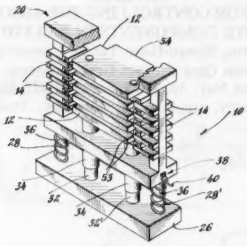
a voltage divider circuit connected to receive said measuring head signal, said voltage divider circuit having an output directly connected to a second input of said comparator, and

a regulating means connected to receive the output of said comparator for controlling said dye fluid heating means to increase the temperature of the dye fluid when the output of said voltage divider circuit is less than the output of said storing circuit and maintaining the temperature of the dye fluid almost constant when the output said voltage divider circuit is greater than the output of said storing circuit.

3,890,511
ELECTRET PULSE GENERATOR

Paul O. Haugsjaa, Acton, and Daniel C. Casella, Hamilton, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Apr. 15, 1974, Ser. No. 460,848
Int. Cl. H03k 3/00
U.S. Cl. 307—106 15 Claims



1. An apparatus for generating a pulse of electrical energy from a mechanical force comprising

a multi-layered structure formed of a first conductor and a second conductor with an electret therebetween, said first conductor being formed with a multiple of spaced elements which are electrically connected to each other with the electret located between the elements;

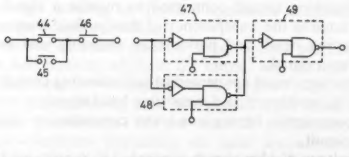
the second conductor being mounted in proximity with the electret at an electrically opposite side thereof in comparison with the electret side on which the first conductor elements are located to form different electrical charge polarities between the first and the second conductors;

said first and second conductors being mounted for relative movement with respect to each other to generate an electrical pulse when the first and second conductors are rapidly separated under action from said mechanical force.

3,890,512
LOGIC CIRCUIT EQUIVALENT TO A RELAY CONTACT CIRCUIT

Yosihiko Kumakawa, Zushi, and Kunio Ikai, Tokyo, both of Japan, assignors to Naigai Industries, Inc., Tokyo, Japan

Filed Dec. 7, 1973, Ser. No. 422,689
Claims priority, application Japan, Sept. 13, 1973, 48-106631
Int. Cl. H03k 19/08
U.S. Cl. 307—203 7 Claims

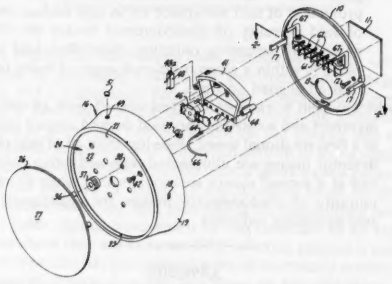


1. A logic circuit comprising a plurality of unit circuits which are connected with each other in first and second connection types, each of said unit circuits comprising an AND element having at least two input terminals and an inverter element connected to one input of the AND element, each of said unit circuits being equivalent to one relay contact in operation, said first connection type being a connection type in which the output of the AND element of one unit circuit is connected to the output of the AND element of another unit circuit to form a wired OR connection whereby a circuit construction for carrying out an OR logical operation of unit circuits is formed, said second connection type being a connection type in which the output of the AND element of one unit circuit is connected to the input of the inverter element of another unit circuit, said other input terminal of said AND element of said unit circuits being connected to a signal source, whereby a circuit construction for carrying out an AND logical operation of unit circuits is formed, the all unit circuits being respectively connected with each other in the same sequence as the relay contacts.

3,890,513
ACOUSTIC TRANSDUCER

David G. Barleen, Lafayette, and Rex B. Peters, Concord, both of Calif., assignors to Systron-Donner Corporation, Concord, Calif.

Filed Feb. 14, 1974, Ser. No. 442,387
Int. Cl. H04r 17/00
U.S. Cl. 310—9.1 12 Claims



1. In an acoustic transducer for radiating or receiving energy of predetermined frequency: a base, a housing having a wall with a generally planar outer surface removably mounted on the base, mating electrical connectors carried by the base and housing for making electrical connections to components mounted in the housing, a substantially flat circular plate mounted outside the housing and spaced from the outer surface of the wall by a distance on the order of an integral number of half wavelengths of the energy to be radiated or received, a piezoelectric ceramic resonator affixed centrally to one side of the plate, and mounting means extending between the plate and the wall, said mounting means engaging the plate at a plurality of points spaced from the center of the plate by a distance corresponding to an integral multiple of one-half wavelength of energy of the predetermined frequency in the plate.

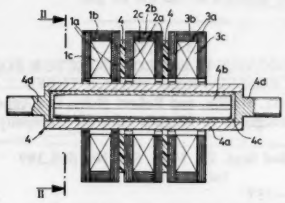
3,890,514
STEP MOTOR WITH OSCILLATION DAMPING

Gerhard Mutz, Villingen-Schwenningen, and Edmund Bausch, Kirchen-Hausen, both of Germany, assignors to Binder Magnete GmbH, Villingen, Germany

Filed Oct. 3, 1973, Ser. No. 403,212
Claims priority, application Germany, Oct. 11, 1972, 2249648
Int. Cl. H02k 37/00
U.S. Cl. 310—49 14 Claims

1. In a step motor comprising a plurality of axially serially positioned stator systems and a rotor; and at least one rotary member being in frictionally rotatable communication with said rotor for effecting rotary oscillation damping thereof, the

improvement comprising; said rotor comprising a hollow cylinder rotatably journalled at both ends thereof, said rotary



member being rotatably supported within and in frictional contact with the inner surface of said hollow cylinder.

3,890,515

MAGNETIC COUPLER FOR COUPLING ROTARY SHAFTS

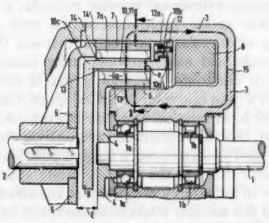
Henri Fehr, Montmorency, and José Mallen-Herrero, Paris, both of France, assignors to Compagnie de Construction Mechanique Sulzer, Paris, France

Filed Nov. 29, 1973, Ser. No. 420,060

Claims priority, application Switzerland, Nov. 30, 1972, 17472/72

Int. Cl. H02k *49/04*

U.S. Cl. 310—104 **10 Claims**



1. A coupler for a pair of coaxial rotary shafts comprising a housing having means for generating an exciting field therein to produce magnetic flux;

a pair of coaxial rotors mounted in spaced apart relation to define an air gap therebetween, each rotor being disposed for mounting on a respective shaft;

a pair of pole rings, each said pole ring being mounted on a respective rotor and located in said air gap in facing relation to each other; and

a stationary rigid gas-tight and liquid-tight partition disposed in said air gap between said pole rings to seal said rotors from each other, said partition including a plurality of magnetizable thin elongated elements extending parallel to and between said opposite poles and embedded in a non-magnetizable highly resistive material in a lattice-like manner, each element forming a magnetic path in the direction of the passage of the magnetic flux through said partition, said elements being electrically connected and grounded at one end, and an insulating layer separating each element from the adjacent elements from said connection through to the opposite end thereof to prevent looping.

3,890,516

PULSE PRODUCING DEVICES

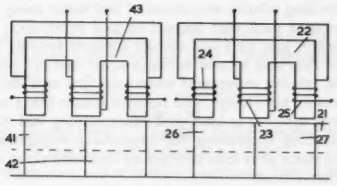
Neville Bruce Widdowson, Redditch, and Christopher Varndell Cullingford, Inkberrow, both of England, assignors to The Lucas Electrical Company Limited, Birmingham, England

Filed Oct. 11, 1973, Ser. No. 405,436

Claims priority, application United Kingdom, Oct. 11, 1972, 46774/72; Apr. 11, 1973, 17507/73; Apr. 26, 1973, 19826/73

Int. Cl. H02k *39/00*

U.S. Cl. 310—111 **3 Claims**



1. A pulse producing device comprising in combination a rotor, an E-shaped core, the outer end surfaces of the limbs of said core being co-planar, a first track on said rotor, said track incorporating a plurality of non-magnetic, conductive areas spaced from each other and the track being positioned so that, as the rotor rotates, said areas in turn pass close to said end surface of one outer limb of said core to modify the flow of flux between the central limb and said one outer limb, a second track on the rotor, the second track being parallel to the first track and also incorporating a plurality of non-magnetic conductive areas spaced from each other and alternating with the conductive areas on the first track, the areas on the second track passing close to said end surface of the other outer limb of said core to modify the flow of flux between the central limb and said other outer limb in turn as the rotor rotates, a first winding on the central limb of the core, and a second winding with two parts wound on the outer limbs of the core, one of said windings being fed in use with an a.c. input signal and an output being taken from the other winding.

3,890,517

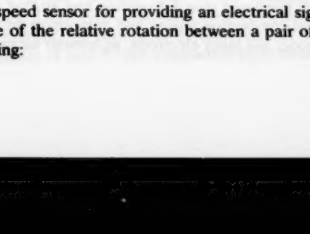
WHEEL SPEED SENSOR

Jeffrey D. Marsh, and Gregg K. McPherson, both of Ann Arbor, Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.

Filed Nov. 23, 1973, Ser. No. 418,558

Int. Cl. G01p *3/48;* **H02k** *19/24*

U.S. Cl. 310—168 **33 Claims**



1. A speed sensor for providing an electrical signal representative of the relative rotation between a pair of members comprising:

a stator having a first surface;

a rotor mounted on a rotatable one of said members having a second surface for confrontation with said first surface to provide a magnetic path between said first and second surfaces having a reluctance which varies with relative rotation of said stator and rotor;

magnetic means associated with said magnetic path for providing a source of magnetic flux for said path;

coil means associated with said magnetic path for providing said electrical signal; and

mounting means for mounting said stator on the other of said members with said first and second surfaces in confrontation, said mounting means including resilient means providing relative movement of said stator along a predetermined path with respect to said rotor upon engagement of said first and second surfaces tending to move said first and second surfaces apart and for restraining said relative movement when said first and second surfaces do not engage, said resilient means being an elastomeric member at least partly surrounding said stator and extending therealong for supporting engagement with said stator at at least two spaced locations along said path of movement.

3,890,518

SPARK IGNITION PLUG

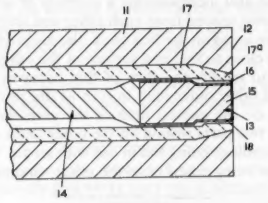
Terence Leslie Tombs, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed June 1, 1973, Ser. No. 366,078

Claims priority, application United Kingdom, June 1, 1972, 72-25628

Int. Cl. H01t *13/20*

U.S. Cl. 313—130 **4 Claims**



1. A spark ignition plug including an outer, annular electrode, an inner electrode formed at least in part of tungsten and an air gap between the electrodes, the tungsten part of the inner electrode being provided with a diffused, oxidation resistant surface layer of silicon.

3,890,519

SPARK DISCHARGE PLUGS

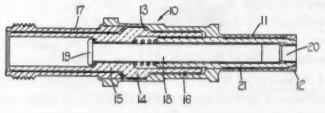
Henry James Chafer, Hemel Hempstead, and Stuart Graham, Coventry, both of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed May 30, 1973, Ser. No. 365,154

Claims priority, application United Kingdom, June 8, 1972, 26692/72

Int. Cl. H01t *13/22*

U.S. Cl. 313—130 **8 Claims**



1. A spark discharge plug for igniting and air/fuel mixture in an internal combustion engine and comprising an annular outer electrode, and inner electrode, an annular air gap intermediate the electrodes and an annular body of dielectric material having a permittvity of at least 50 interposed between one of the electrodes and the air gap, said body acting to ensure that when the electrodes are connected to a source of electric supply a substantial proportion of the voltage of the electric supply appears across the air gap.

3,890,520

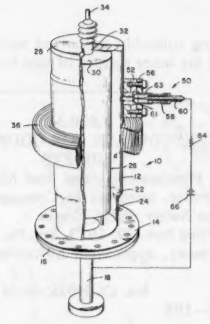
CONTINUOUS ELECTRON INJECTOR FOR CROSSED-FIELD SWITCH TUBES

Michael A. Lutz, Malibu, and Robert Holly, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Sept. 23, 1974, Ser. No. 508,389

Int. Cl. H01l *23/10*

U.S. Cl. 313—157 **3 Claims**



1. A crossed-field switch tube having an electron emitter, said crossed-field switch tube comprising:

a substantially cylindrical tubular cathode, a substantially cylindrical anode positioned within said cathode and defining an annular interelectrode space therebetween, said anode and said cathode being connectable to a source of electrode potential, a gas at subatmospheric pressure within said interelectrode space, the gas pressure being such, in relation with the interelectrode space dimension, that the conditions are outside the conductive area of the Paschen curve, a magnet positioned to provide a magnetic field in the interelectrode space so that an electron in the interelectrode space is caused to annularly spiral in the annular interelectrode space to provide cascading ionization and conduction between said anode and said cathode, said electron emitter comprising:

a field emitter in communication with said interelectrode space and insulated from one of said electrodes so that upon application of an electrical potential to said emitter, electrons are emitted into said interelectrode space to reduce ignition time delay and jitter of said crossed-field switch tube.

3,890,521

X-RAY TUBE TARGET AND X-RAY TUBES UTILISING SUCH A TARGET

Arvind Shroff, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 27, 1972, Ser. No. 318,904

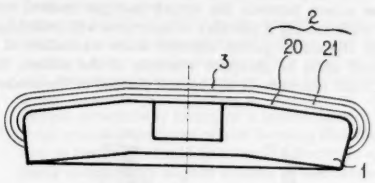
Claims priority, application France, Dec. 31, 1971, 71.47766

Int. Cl. H01j *35/10*

U.S. Cl. 313—55 **2 Claims**

1. A target for X-ray tubes constituted by a carrier of graphite and an emissive layer made of tungsten covering said carrier and being separated by an intermediate layer, said intermediate layer is constituted by two sub-layers one of which is in contact the carrier and is made of an element selected from

the group consisting essentially of iridium, osmium and ruthenium, and the other in contact with the emissive layer is made



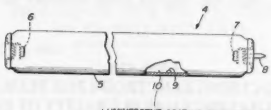
of an element selected from the group consisting essentially of hafnium, niobium, tantalum and zirconium.

3,890,522

FLUORESCENT LAMP WITH PHOSPHOR COATING HAVING IMPROVED ADHERENCE TO ENVELOPE WALLS

Richard M. Klein, Framingham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 29, 1973, Ser. No. 364,568
Int. Cl. H01j *1/64, 63/04*
U.S. Cl. 313—485 **2 Claims**



LUMINESCENT COATING OF PHOSPHOR PARTICLES IN GLASSY PHOSPHATE MATRIX SELECTED FROM AMMONIUM DIHYDROGEN PHOSPHATE OR A MIXTURE OF ZINC NITRATE AND ORTHOPHOSPHORIC ACID

1. A fluorescent lamp comprising a tubular envelope; a coating on the interior surface thereof, said coating consisting essentially of a major amount of finely-divided phosphor particles within a minor amount of a glassy phosphate matrix selected from the group consisting of ammonium dihydrogen phosphate and a mixture of zinc nitrate and orthophosphoric acid, said coating exhibiting improved adherence to said interior surface without significantly decreasing the luminosity of said coating upon excitation, mercury vapor within said envelope; and a pair of electrodes spaced within said tubular envelope and being adapted for connection, at those portions thereof extending outside of said envelope, to means for producing an electric discharge within said tubular envelope.

3,890,523

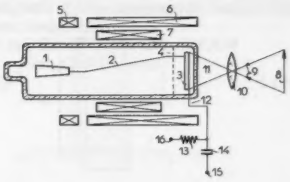
VIDICON TARGET CONSISTING OF SILICON DIOXIDE LAYER ON SILICON

Raymond Poirier, Paris, France, assignor to Thomson-CSF, Paris, France

Continuation of Ser. No. 130,625, April 2, 1971, abandoned. This application Dec. 13, 1972, Ser. No. 314,619
Claims priority, application France, Apr. 7, 1970, 70.12541
Int. Cl. H01j *29/45, 31/38*
U.S. Cl. 313—366 **3 Claims**

1. In a cathode ray tube intended for producing a video signal, a target consisting of:

an N-type silicon semiconductor layer having a face exposed to the incident light radiation and another face directed towards said cathode and deposited on said other face, a silicon dioxide dielectric layer upon said semiconductor layer having a uniform thickness comprised between 50 and 500 A in order to take the impact of the electron beam, the semiconductor and the dielectric layer having an interface, having free energy levels in the forbidden band of the semiconductor for trapping



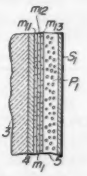
positive charge carriers, and means for applying to said face of said semiconductor layer a predetermined d.c. potential.

3,890,524

PHOTO-CONDUCTIVE TARGET COMPRISING BOTH SOLID AND POROUS LAYERS

Rokuro Watanabe, and Mitsuhiro Yoshikawa, both of Mobara, Japan, assignors to Hitachi, Ltd., Japan

Filed June 27, 1972, Ser. No. 266,708
Int. Cl. H01j *29/45, 31/38*
U.S. Cl. 313—386 **15 Claims**



14. A compound photo-conductive target for use in eletron gun type pick-up tubes comprising a transparent conductive film, a first thin amorphous solid layer provided on said conductive film, a second thin amorphous solid layer, and a porous layer intervening between said first and second thin amorphous solid layers, all of said layers consisting essentially of a photo-conductive material of the V–VI group of compounds, at least one of said solid layers having a multi-layer structure consisting of a plurality of sub-layers, the V-group element content of said photo-conductive material being greater for sub-layers successively remote from said transparent conductive film.

3,890,525

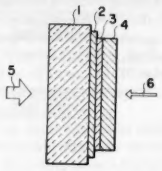
PHOTOCONDUCTIVE TARGET OF AN IMAGE PICKUP TUBE COMPRISING GRADED SELENIUM-TELLURIUM LAYER

Tadaaki Hirai, Koganei; Eiichi Maruyama, Kodaira; Kiyohisa Inao, Hachioji; Hideaki Yamamoto, Kokubunji; Naohiro Goto; Yukina Isozaki, both of Machida; Keiichi Shidara, and Teruo Uchida, both of Tokyo, all of Japan, assignors to Hitachi, Ltd. and Nippon Hoso Kyokai, both of, Japan

Filed June 15, 1973, Ser. No. 370,446
Int. Cl. H01j *29/45, 31/38*
U.S. Cl. 313—386 **10 Claims**

1. A photoconductive target of an image pickup tube comprising a light-transmitting substrate, a first N-type conductive layer deposited on said substrate and a P-type conductive layer making a rectifying contact at a first surface thereof with said first N-type conductive layer and having a second outer surface to be scanned by electrons, said P-type conductive layer including at least selenium and tellurium, the composition of said P-type conductive layer being different along the direction of the thickness thereof, the average content of selenium in said P-type conductive layer being not less than 50 atomic percent, the content of tellurium at said first and second surfaces of said P-type conductive layer being not more

than 10 atomic percent, the maximum tellurium content of 10 to 40 atomic percent being located on a plane in said P-type



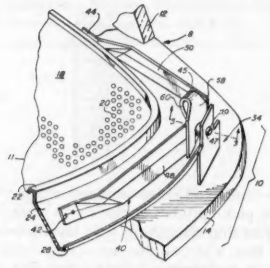
conductive layer between said first N-type conductive layer and the middle plane of said P-type conductive layer.

3,890,526

FACEPLATE MOUNTING STRUCTURE FOR CATHODE RAY TUBE COLOR SELECTION ELECTRODE

Kazimir Palac, Carpentersville, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Dec. 26, 1973, Ser. No. 428,176
Int. Cl. H01j *29/02, 29/08, 31/20*
U.S. Cl. 313—408 **4 Claims**



1. A component of a color cathode ray tube of a type having a color selection electrode which carries electrode suspension elements at a plurality of points spaced around the periphery thereof, comprising:

a flangeless, three-dimensionally curved faceplate having a concave inner surface and

a plurality of low-cost, lightweight metal studs embedded at spaced points around the periphery of said faceplate corresponding to the locations of the electrode suspension elements on the color selection electrode for supporting a color selection electrode in precise spaced relationship to said faceplate inner surface, each of said studs being relatively flat with a cross-section of substantially greater width than thickness and having a tip embedded in the envelope and means for making captive engagement with a suspension element on a color selection electrode.

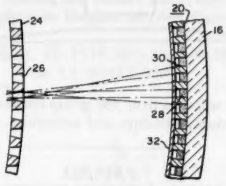
3,890,527

TRIAD COLOR SCREEN HAVING ELEMENTS LARGER THAN MASK APERTURES NEAR SCREEN CENTER AND SMALLER NEAR PERIPHERY

Himanshu M. Patel, Horseheads, and George D. Dimmick, Bath, both of N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 26, 1973, Ser. No. 354,579
Int. Cl.² H01J *29/07, 29/32*
U.S. Cl. 313—408 **4 Claims**

1. In a color television tube comprising; a hermetically sealed envelope, a phosphor screen faceplate portion having a plurality of triad arrays of phosphor windows with the individual phosphor windows comprising an electron beam excitable primary color emissive phosphor material surrounded by opaque material, electron gun means for directing an electron beam toward the phosphor screen, shadow mask means proximate the screen between the screen and gun means, said shadow mask having a plurality of apertures with individual apertures aligned to permit electron beam excitation of a single triad array of phosphor windows of the screen, the shadow mask apertures in the central portion of the shadow



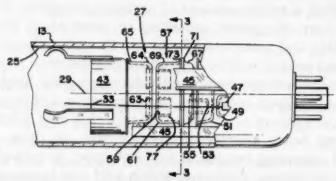
mask being slightly larger than the apertures through the remaining perimeter portion of the mask, the improvement wherein the phosphor window area for the central portion of the phosphor screen is greater than the area of the aligned mask aperture and approximately equal to the electron beam area which impinges the central portion of the screen, while the phosphor window area for the perimeter portion of the screen is less than the aligned mask aperture and electron beam area.

3,890,528

COMMON FOCUSING ELECTRODE FOR PLURALITY OF BEAMS AND HAVING SAME PLURALITY OF INTERNAL SHIELDS

Donald L. Say, Waterloo, and Harry E. Smithgall, Seneca Falls, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Mar. 29, 1974, Ser. No. 456,078
Int. Cl. H01j *29/50, 29/56*
U.S. Cl. 313—414 **4 Claims**



1. An improvement in a cathode ray tube multibeam bipotential electron gun structure having a longitudinal axis therethrough and having electron generating means therein formed to emit a plurality of separately controlled electron beams whereof each beam emanates from a substantially longitudinal arrangement of several related apertured grid electrodes positioned in sequential orientation in front of a rear positioned cathode component, said improvement being in the forward region of said electrode arrangement and comprising:

a common focusing electrode member having a forward oriented front aperture plane spaced longitudinally from a rearward oriented rear aperture plane, said planes having a similar plurality of substantially circular related apertures therein, each of said front apertures having a defined tube-like extensive encompassing member of substantially cylindrical shaping integral with said front aperture plane and fabricated to extend rearward therefron a related smaller-dimensioned rear aperture formed in said rear aperture plane to effect shielding for the

respective electron beam passing therethrough; each of said tube-like shielding members being of substantially equal cross-sectional dimensioning and having a length at least equaling 50 percent of the radius of the associated front aperture; and

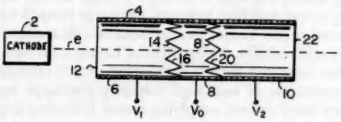
a common accelerating electrode member positioned forward of said focusing electrode member and having an aperture plane proximal to the front aperture plane of said focusing electrode member, said accelerating electrode aperture plane having a plurality of apertures therein substantially mating in a spatial manner with the front oriented apertures of said focusing electrode member, at least two of said accelerating electrode apertures being eccentrically aligned relative to said related focusing electrode front apertures to form non-symmetrical electrostatic lenses for focusing the respective individual electron beams traversing the particular region; each of said focusing electrode shielding members providing enhanced beam focusing by effecting improved symmetry of the equipotential lines of force in particularly the region of low beam velocity in the focusing electrode portion of said electrostatic lensing field.

3,890,529

COMPOUND ELECTROSTATIC LENS SYSTEM

Rudolf G. E. Hutter, New York, N.Y., and Herman O. Dressel, Lynnfield, Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 28, 1974, Ser. No. 473,539
Int. Cl. H01j *29/02, 29/48*
U.S. Cl. 313—460 **5 Claims**



1. A compound electrostatic electrode lens system for combined focusing and acceleration of an electron beam comprising:

A. first, second and third cylindrical electrode sections,

B. the first section being even ended at one end and terminating in serrations of a first pattern at its other end,

C. the second section having one end substantially adjacent to but insulated from the other end of the first section, the one end of the second section terminating in serrations which fill in the serrations of a first pattern of the first section, the other end of the second section terminating in serrations of a second pattern,

D. the third section having one end substantially adjacent to but insulated from the other end of the second section, the one end of the third section terminating in serrations which fill in the serrations of a second pattern of the second section, the other end of the third section being even ended, and

E. means for applying chosen potentials to each of the three sections,

wherein both the first pattern and the second pattern are cyclic patterns which repeat at least eight times around the circumference of the cylindrical sections and which are diametrically symmetrical with respect to the axis of the cylindrical sections at all points on the axis and all rotational positions of the diameter.

3,890,530

PRECOAT FOR FLUORESCENT LAMP

Edward E. Hammer, Mayfield Village, and William C. Martyny, Lyndhurst, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 22, 1973, Ser. No. 325,430
Int. Cl. H01j *61/35*
U.S. Cl. 313—489 **6 Claims**

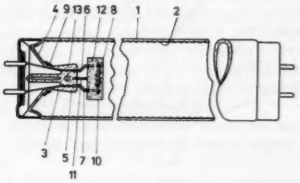
1. A mercury-vapor discharge lamp comprising a sealed glass envelope having electrodes sealed therein, and a composite protective barrier coating adhering to the inner surface of said envelope, said coating comprising a first layer consisting essentially of titanium dioxide coated on an adhering to the inner surface of said envelope and a second layer consisting essentially of aluminum oxide and antimony oxide over said titanium dioxide layer, and a phosphor coating over said second layer of the protective coating.

3,890,531

LOW PRESSURE MERCURY VAPOR DISCHARGE LAMP WITH AMALGAM

Ernst Panofski, Augsburg, and Erhard Rasch, Ottobrunn, both of Germany, assignors to Patent-Treuhand-Gesellschaft fur Elekstriche Gluhlampen mbH, Munich, Germany

Filed June 5, 1974, Ser. No. 476,478
Claims priority, application Germany, June 14, 1973, 2330391
Int. Cl.[2] H01J *61/26, 61/42*
U.S. Cl. 313—490 **12 Claims**

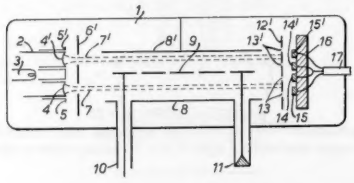


1. In a mercury vapor discharge lamp of the fluorescent type comprising an elongated transparent envelope having electrodes sealed into its ends, at least one of said electrodes being connected to an electrode positioning means, said electrode positioning means containing on its surface at least one ductile metal composition as the amalgam-forming metal, the improvement comprising utilizing as said ductile metal composition, a ductile amalgam-forming metal and at least one aluminum alloy selected from the group consisting of silicon-aluminum and beryllium-aluminum, said aluminum alloy being a separate solid phase dispersed throughout said ductile amalgam-forming metal at the operating temperature.

3,890,532
MICROWAVE AMPLIFIERS

Maurice Esterson, Chelmsford, England, assignor to English Electric Valve Company Limited, Chelmsford, England

Filed Oct. 3, 1973, Ser. No. 403,042
Int. Cl. H01j 23/16, 29/96
U.S. Cl. 315—3 6 Claims

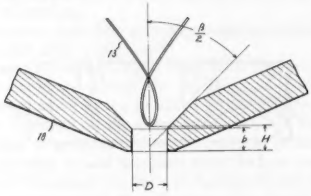


1. A microwave amplifier including means for generating and projecting two electron beams; a meander structure longitudinally positioned between and common to the two electron beams; two co-operating electrodes which are positioned so that the two electron beams and said meander structure lie between them; two pairs of beam receiving diodes, one pair for each beam, so positioned that each electron beam travelling undeflected between the meander structure and one of said co-operating electrodes will pass between a corresponding pair of beam receiving diodes; and means for coupling R.F. energy to the meander structure, whereby in operation the R.F. energy produces a transverse electric field between the meander structure and each said co-operating electrode so as to deflect the two electron beams in opposite directions such that each electron beam impinges upon one diode of its respective pair of beam receiving diodes.

3,890,533
THERMAL EMISSION TYPE ELECTRON GUN

Akira Tanaka, Akishima, Japan, assignor to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed July 9, 1973, Ser. No. 377,812
Claims priority, application Japan, Aug. 8, 1972, 47-83891
Int. Cl. H01j 29/70
U.S. Cl. 315—31 R 3 Claims

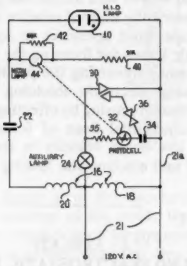


1. In a thermal emission type electron gun comprising a filament for emitting thermal electrons, an anode arranged to face said filament, a voltage source for supplying high potential difference between said filament and anode, a Wehnelt electrode having an opening therein through which said electrons pass, said Wehnelt electrode arranged between said filament and anode, the side of said Wehnelt electrode facing the anode being convex, and means for supplying a potential to maintain the Wehnelt electrode at a negative potential with respect to the filament, the improvement comprising the distance H between the tip of the filament and the lower rim of the Wehnelt opening satisfying the relation $0.4D \leq H \leq 0.8D$ where D is the diameter of the opening the Wehnelt electrode, and the surface of the Wehnelt electrode near the opening being substantially cylindrical and the surface about the opening facing the filament being substantially cone-shaped and the angle β of said cone-shaped portion with the axis of the cylindrical opening satisfying the relation $30° \leq \beta \leq 90°$.

3,890,534
LIGHTING CONTROL SYSTEM

Victor Horowitz, Oceanside, N.Y., assignor to Current Industries, Inc., Oceanside, N.Y.

Continuation-in-part of Ser. No. 371,503, June 19, 1973, abandoned. This application June 19, 1974, Ser. No. 480,711
Int. Cl.[2] H05B 37/04, 41/46
U.S. Cl. 315—92 5 Claims



1. A circuit for energizing an auxiliary lamp only in response to hot start condition of a high intensity discharge lamp, consisting of a voltage sensing circuit connected directly across said high intensity discharge lamp, means responsive only to a voltage as sensed by said voltage sensing circuit indicating that said high intensity lamp is in hot start condition for supplying energizing current to said auxiliary lamp, and a common source of ac voltage for said lamps, wherein said voltage sensing circuit includes a resistive voltage divider connected directly across said high intensity discharge lamp, a neon lamp connected across one of the resistors of said resistive voltage divider, said resistive voltage divider having a division relation such that said neon lamp is illuminated only in response to hot start conditions of said high intensity discharge lamp, said auxiliary lamp current supplying means including a triac connected in series with said auxiliary lamp across said source of AC voltage, and means including a photocell responsive only to illumination of said neon lamp for firing said triac, said last means including a phasing capacitor and a phasing resistance connected in series with said photocell across said source of ac voltage, and means connecting a trigger circuit of said triac to an electrode of said capacitor.

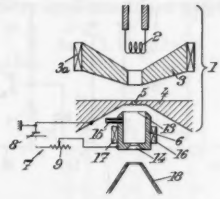
3,890,535
ION SOURCES

Guy Gautherin, Orsay, and Jean Aubert, Vaucresson, both of France, assignors to Agence National de Valorisation de la Recherche (ANVAR), Paris, France

Filed Oct. 11, 1972, Ser. No. 296,594
Claims priority, application France, Oct. 13, 1971, 71.36701
Int. Cl. H01j 37/08; H05h 1/00
U.S. Cl. 315—111 10 Claims

1. Ion source comprising a primary plasma generator constituted by a hot cathode and an anode, between which an arc is produced, said anode defining an extraction orifice, and by an intermediate electrode pinching the arc in proximity to said extraction orifice in the anode, magnetic field producing means creating a magnetic field between the intermediate electrode and the extraction orifice, an extraction electrode downstream of said anode, said extraction orifice of the anode having a relatively small cross-section so that the pressure of the gases occurring inside said primary plasma generator is independent of the pressure existing downstream of said extraction orifice, said pressure downstream of the extraction

orifice being less than said pressure inside the primary plasma generator, said generator comprising a fifth electrode arranged downstream of the extraction orifice of the anode and upstream of the extraction electrode and means for applying



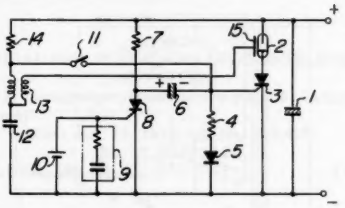
to said fifth electrode a potential positive with respect to that of the anode and of adjustable value, said positive potential being small in absolute value compared to the potential of the extraction electrode with respect to that of said fifth electrode.

3,890,536

ELECTRONIC FLASH DEVICE FOR PHOTOGRAPHY

Hiroshi Iwata, Osaka, Japan, assignor to West Electric Company, Ltd., Osaka, Japan

Continuation of Ser. No. 134,798, April 16, 1971, abandoned.
This application Apr. 3, 1973, Ser. No. 347,378
Claims priority, application Japan, Apr. 27, 1970, 45-36576; Apr. 27, 1970, 45-36577; June 8, 1970, 45-49681; June 8, 1970, 45-49682; June 8, 1970, 45-49683
Int. Cl. H05b 37/02
U.S. Cl. 315—151 7 Claims



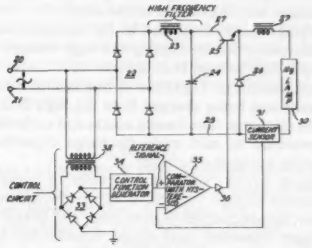
1. An electronic flash device comprising a luminescent discharge tube having a trigger electrode; a gate turn off element having an anode, a cathode and a gate and connected in series with said discharge tube; a main discharging capacitor connected across the series circuit of said discharge tube and said gate turn off element; a series circuit of a trigger capacitor, the primary of a transformer, a switch, a resistor and a diode, said resistor and said diode being connected between the gate and cathode of said gate turn off element to provide a first trigger circuit for applying a first trigger pulse voltage to said gate turn off element, the secondary of said transformer being connected to the trigger electrode of said discharge tube to provide a second trigger circuit for applying a second trigger pulse to said discharge tube, said first and second trigger circuits simultaneously applying the first and second trigger pulse voltages to said gate turn off element and said discharge tube, respectively, to simultaneously trigger said gate turn off elmeent and said discharge tube when said switch is closed to cause said trigger capacitor to discharge through the primary of said transformer, said resistor and said diode, said main discharging capacitor being discharged upon the simultaneous triggering of said discharge tube and said gate turn off element, so that said discharge tube is energized for luminescence; a luminescence detection circuit to monitor light radiated from said discharge tube and reflected by a foreground subject; and a control circuit coupled to said luminescence detection circuit, including a series circuit of a semiconductor switching element and a control capacitor, connected between the gate and cathode of said gate turn off element, said diode being coupled to said control capacitor forwardly with respect to the charging direction of said control capacitor and reversely with respect to the discharging direction of said control capacitor, said semiconductor switching element being triggered by said detection circuit when the quantity of light received by said luminescence detection circuit reaches a predetermined value; said control capacitor being discharged upon triggering of said semiconductor switching element to impress a reverse cut-off voltage across the gate and cathode of said gate turn off element, thereby cutting off said gate turn off element to turn off said discharge tube.

3,890,537

SOLID STATE CHOPPER BALLAST FOR GASEOUS DISCHARGE LAMPS

John N. Park, Rexford; Steven C. Peak, Schenectady, and Robert L. Steigerwald, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 2, 1974, Ser. No. 430,088
Int. Cl. H05b 41/24; G05f 1/08
U.S. Cl. 315—208 15 Claims



1. A solid state ballast circuit for gaseous discharge lamps comprising

a solid state chopper circuit for energization by low frequency alternating-current line voltage and line current and including high frequency filter means for supplying sinusoidal power voltage between a pair of supply terminals and controlled switching means and coasting device means effectively coupled to said supply terminals and coasting inductor means to be conductive alternately to supply lamp current through said coasting inductor means to a gaseous discharge lamp,

current sensor means coupled to sense the instantaneous lamp current and produce a sensor signal indicative thereof,

a control circuit comprising generating means for generating a reference signal with a preselected waveshape and magnitude to determine the power level and to effect shaping of said lamp current and therefore the line current to obtain a high power factor, comparing means for effectively comparing said sensor and reference signals and producing an output signal, and means actuated by said output signal for supplying turn-on and turn-off signals to operate said controlled switching means at a variable high frequency chopping rate and shape said lamp current as determined by said reference signal,

said control circuit further comprising means for temporarily shaping and increasing the magnitude of said reference signal at start-up to obtain a high starting lamp current, and

said control and chopper circuits further comprising means for supplying minimum lamp current for good reignition characteristics during the low voltage regions of said line

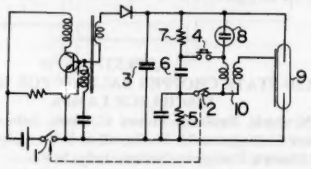
voltage in each cycle when said comparing means is ineffective to shape the lamp current.

3,890,538

PHOTOGRAPHIC ELECTRONIC FLASH APPARATUS

Hiroshi Iwata; Yasunori Sawada, both of Osaka, and Tetsuo Yamaoka, Settsu, all of Japan, assignors to West Electric Company, Ltd., Osaka, Japan

Filed Dec. 26, 1973, Ser. No. 427,729
Claims priority, application Japan, Dec. 28, 1972, 47-3450
Int. Cl. H05b *41/32*
U.S. Cl. 315—241 P **6 Claims**



1. A photographic flash apparatus comprising: a D.C. to A.C. converter circuit having a low-voltage power supply coupled to a transformer primary through a transistor and a first switching means, for generating a high voltage A.C. signal in an output winding of said transformer;

rectifying means connected to the output winding of said transformer for converting the high voltage A.C. signal into a high voltage D.C. signal;

a main discharge capacitor connected to said rectifying means and being charged from the high D.C. voltage;

a flash discharge tube having anode and cathode electrodes connected to said main discharge capacitor and also having a trigger electrode;

a trigger circuit including a resistor, a trigger capacitor coupled to said resistor, a trigger switch and a trigger transformer coupled to each other and to said resistor and trigger capacitor, said trigger transformer including an output winding connected to said trigger electrode of said flash discharge tube; and

a second switching means electrically coupled to said trigger circuit and coupled with said first switching means of said converter circuit, said second switching means rendering said trigger circuit operative to trigger said flash discharge tube when said first switching means is in an on state and rendering said trigger circuit inoperative to prevent it from triggering said tube when said first switching means is in an off state.

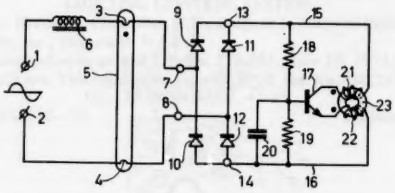
3,890,539

IGNITION OF DISCHARGE TUBES

Michel Remery, Evreux, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 6, 1973, Ser. No. 422,588
Claims priority, application France, Dec. 15, 1972, 72.44734; Feb. 26, 1973, 73.06689
Int. Cl. H05b *41/16*
U.S. Cl. 315—273 **11 Claims**

1. A control circuit for an electric discharge tube provided with at least two electrodes comprising, a pair of input terminals for applying an AC supply voltage to said control circuit, an inductor, means connecting the series arrangement of the inductor and the discharge tube across said input terminals, an auxiliary branch circuit for connecting the tube electrodes electrically together for a short time during the ignition procedure and including a rectifier member having input terminals connected to the tube electrodes and an output section connected to two electrical supply conductors which serve to supply a transistor circuit for establishing said short-lasting electrical connection, the transistor circuit comprising a transformer having a first winding which is connected between the collector of the transistor and one of the two supply conductors and a second winding connected between said second



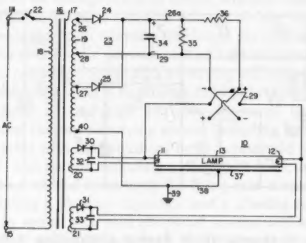
supply conductor and a second electrode of the transistor, and means connecting the third transistor electrode to the second supply conductor.

3,890,540

APPARATUS FOR OPERATING GASEOUS DISCHARGE LAMPS ON DIRECT CURRENT FROM A SOURCE OF ALTERNATING CURRENT

Henry Whitfield Ott, Sarasota, Fla., assignor to John Ott Laboratories, Inc., Sarasota, Fla.

Filed Feb. 19, 1974, Ser. No. 443,825
Int. Cl. H05b *41/04*, *41/19*
U.S. Cl. 315—335 **9 Claims**



1. Apparatus for starting and operating a gaseous discharge lamp so as to provide flickerless operation of the lamp, said lamp having a pair of electrodes across which a voltage is applied to start and operate the lamp, said apparatus comprising:

a. a conductor member placed in close proximity to the lamp so that a small capacity exists between the conductor member and the lamp electrodes,

b. power transformer means adapted to be connected to an AC power source comprising two series-connected secondary winding sections,

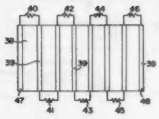
c. rectifier means having an AC input circuit connected to one of said secondary winding sections and an output circuit connected to the lamp electrodes for operating the lamp on a DC current flowing between the lamp electrodes, and

d. circuit means connecting said conductor member to the other of said secondary winding sections at a potential point such that an AC voltage is applied across the conductor member and the lamp electrodes whereby a capacitive current flows therebetween to aid starting of the lamp without causing an AC ripple in the DC current flowing between the lamp electrodes.

3,890,541
CATHODE RAY TUBE APPARATUS

Brian Dennis McCarthy, Oxted, and Anthony Victor Krause, Ashtead, both of England, assignors to Sanders Associates, Inc., South Nashua, N.H.

Filed Mar. 31, 1971, Ser. No. 129,824
Claims priority, application United Kingdom, Apr. 2, 1970, 15746/70
Int. Cl. H01j *29/70*
U.S. Cl. 315—366 **8 Claims**

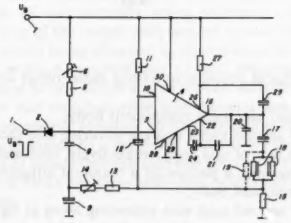


1. Cathode ray tube apparatus including an electron beam source, an electroluminescent screen, a beam-directing electrode spaced from the screen and including an insulating support sheet, a series of parallel strips of conductive material on the support sheet and resistor elements interconnecting the ends of the strips to provide a series connection; the electron beam source being arranged to launch an electron beam into the space between the screen and the beam-directing electrode, means to connect beam-directing potentials between the screen and the beam-directing electrode to provide a beam-directing field in the space between them for directing the electron beam towards the screen and means to deflect the beam in two directions arranged to be operative upon the beam before it enters the space.

3,890,542
VERTICAL DEFLECTION CIRCUIT FOR TELEVISION RECEIVERS

Gunter J. Zimmermann, Drosselstrasse 12, 8051 Langenbach, Germany

Filed Aug. 15, 1973, Ser. No. 388,437
Int. Cl. H01j *29/70*
U.S. Cl. 315—389 **2 Claims**



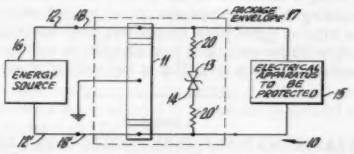
1. Vertical deflection circuit for a television receiver, including vertical deflection coil means; integrated circuit audio amplifier means having an output connected by capacitor means to one end of said deflection coil means, said amplifier means including a differential input stage having an inverting input and a non-inverting input; a DC supply terminal connected to said amplifier to supply a DC bias voltage thereto; a repetitive saw-tooth deflection control signal generating circuit connected to said non-inverting input; said amplifier being operable to supply deflection current to said deflection coil means in response to said deflection control signal;

a DC supply voltage terminal connected to said amplifier means, and said amplifier means including means for producing internal symmetry of said amplifier such that said amplifier produces a quiescent output voltage equal to about one-half of said supply voltage, resistance means connected externally of said amplifier means between said DC supply terminal and said inverting input to substantially cancel said internal symmetry of said amplifier to reduce the value of said quiescent output voltage so that substantially the whole magnitude of said DC supply voltage is utilized in driving said deflection current through said deflection coil means; said deflection control signal generating means comprising first high value resistance means connected between said DC voltage supply terminal and said non-inverting input and capacitor means connected to said non-inverting input so that said capacitor means is charged from said DC voltage supply terminal through said high value resistor means; and means for applying repetitive pulses to said inverting input to rapidly discharge said capacitor means such that said charging and discharging of said capacitor means generates said repetitive saw-tooth deflection control signal; the other end of said deflection coil means being connected to a reference potential by second resistance means so that current flow through said deflection coil means generates a voltage across said second resistance means proportional to said current; feedback capacitor means connected between said inverting input and the junction between said resistor and said other end of said deflection coil means to feedback to said inverting input a negative feedback current having a magnitude determined by said current flow through said vertical deflection coil means thereby to significantly increase the effective internal resistance of said audio amplifier means and reduce the damping effect thereof on said vertical deflection coil means.

3,890,543
LOW VOLTAGE SURGE PROTECTION NETWORK

Gaylord D. Jonassen, Smithtown, N.Y., assignor to Telecommunications Industries, Inc., Copaigue, N.Y.

Filed Sept. 14, 1973, Ser. No. 397,258
Int. Cl. H02h *3/22*
U.S. Cl. 317—16 **10 Claims**



1. A low voltage surge protection network for protecting from a line imbalance electrical apparatus coupled across an energy source, said network comprising:

a. a pair of semiconductor switching devices electrically coupled in series, in an oppositely poled back-to-back configuration, said electrical characteristics providing for instantaneous triggering upon the occurrence of a line imbalance;

b. a multi-electrode gas tube arrester wherein one of said electrodes is electrically coupled to ground, said multi-electrode gas tube arrester being rendered conductive by a voltage level that is below that which would cause the destruction of said pair of Zener Diodes;

c. means for providing direct electrical coupling of said Zener Diode configuration across the ungrounded electrodes of said multi-electrode gas tube arrester;

d. means for electrically coupling said network across said source of energy and in shunting configuration with said electrical apparatus; and

e. thermal responsive means for interrupting the flow of electrical energy to said network upon having said network reach a predetermined temperature level, wherein said means for interrupting the flow of electrical energy to said network comprises a hollow electrically conductive lining electrically coupled at one end to an ungrounded electrode of said multi-electrode gas tube arrester and the other end of said hollow electrically conductive lining being electrically coupled to said means for electrically coupling said network across said source of energy, said electrically conductive lining being encapsulated within a thermal and electrically insulative material.

3,890,544

MEANS FOR LIMITING THE DYNAMIC OVERREACH IN, FOR EXAMPLE, AN IMPEDANCE RELAY

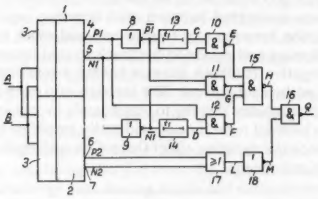
Michei Chamia, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Apr. 15, 1974, Ser. No. 460,988

Claims priority, application Sweden, May 21, 1973, 7307107

Int. Cl.[2] H02H *3/26*

U.S. Cl. 317—27 R **4 Claims**



1. Means for limiting the dynamic overreach in impedance relays and the like comprising a first comparator means (1) for comparing the condition of two periodic alternating quantities (A, B) and including means to deliver a signal of a definite appearance when a primary condition is fulfilled, a second comparator means (2) including means to deliver a signal when a secondary condition is fulfilled, the secondary condition being a limitation of the primary condition, and means connecting the two comparator means to each other to transmit a tripping signal when the primary condition is fulfilled at two consecutive measuring opportunities as well as when the secondary condition is fulfilled at any measuring opportunity.

3,890,545

TRAVELING-WAVE-TUBE PROTECTION CIRCUIT

Robert Rosen, Granada Hills, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 12, 1974, Ser. No. 460,317

Int. Cl.[2] H02H *7/20*

U.S. Cl. 317—51 **9 Claims**

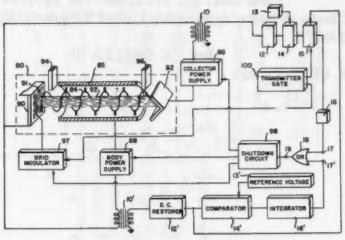
1. A protection circuit for an electronic device having a current path within said device comprising:

a transformer having a primary and a secondary winding, means connecting said primary winding serially with said current path;

a d.c. restorer circuit having an input coupled to said secondary winding;

a comparator circuit coupled to the output of said d.c. restorer circuit and having a reference voltage generator which produces a predetermined voltage representative of current desired in said path, and providing an output signal when the voltage at the output of said restorer circuit exceeds said reference voltage;

an integrator having an input connected to the output of said comparator and providing an output signal when said comparator output signal remains present for longer than a predetermined period of time; and



protection means coupled to said integrator and responsive to an output signal therefrom for shutting off power to said device.

3,890,546

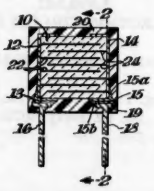
ELECTRICAL COMPONENT WITH OFFSET RADIAL LEADS

James H. Coleman, Wichita Falls, Tex., assignor to Sprague Electric Company, North Adams, Mass.

Filed June 3, 1974, Ser. No. 475,465

Int. Cl. H01c *1/035, 1/14*

U.S. Cl. 317—258 **9 Claims**



1. An electrical component having radial offset leads comprising:

a rectangular electrical component body;

a first and second metal coating covering one face and an opposite face of said body, respectively, each said coating extending over a portion of a common adjacent face of said component body;

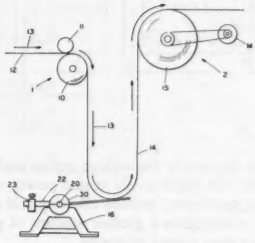
a first and second lead wire extending away at right angles from said common adjacent face, said lead wires each having an enlarged end portion and a shaft portion, a part of said enlarged end portion of said first and second lead wires being offset and projecting outwardly beyond said one and said opposite faces, respectively; and

solder bonds between said enlarged end portions of said first and second lead wires and said first and second coatings, respectively, a solder fillet filling the corner formed at said projecting enlarged end portion, said shaft of said lead wires lying in a plane that is essentially coincident with a bisecting plane of said body, a first body surface plane in which said one body face lies being intersected by said shaft of said first lead wire and a second body surface plane in which said opposite body face lies being intersected by said shaft of said second lead wire.

3,890,547
SPEED CONTROL DEVICE

Norman Keck, 707 Fourth Ave., Joliet, Ill. 60433

Filed Mar. 31, 1972, Ser. No. 239,927
Int. Cl. B65h 23/18
U.S. Cl. 318—6 4 Claims



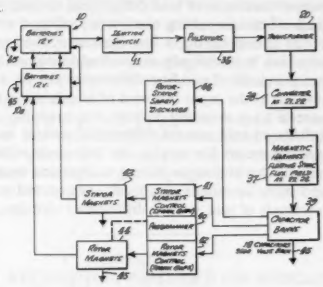
1. In a machine wherein a flexible material is passed at varying speeds through one section of the machine and also through another section of the machine with said material sagging between said sections to form a loop, said machine having a device coordinating the speed of said material in each of said sections, the improvement in said device comprising a titltable structure, a switch on said tiltable structure, said switch being of the type which shifts between making contacts and breaking contacts when its axis is tilted to a predetermined angle with the horizontal, said switch being adjustably mounted on said structure to permit adjustment by tilting said switch with respect to said tiltable structure, means sensitive to the extent said material sags between said sections for tilting said structure, and means sensitive to a shift of said switch upon the tilting of said switch to bring its axis to said predetermined angle for changing the speed of said material through one of said sections to bring the speed of said material in said sections more nearly into equilibrium, said machine including a plurality of said switches mounted on said tiltable structure each separately tiltable with respect to said structure, each of said switches being separately adjustable to permit tilting of the switch with respect to said structure, said sensitive means being effective to tilt said structure to a predetermined angle to operate one of said switches when said material sags to one extent and to tilt said structure to operate another of said switches when said material sags to a greater extent, and means sensitive to the operation of said other switch for changing by a second increment the speed at which said material passes through said one section to thereby bring the speed of said material in said sections still more nearly into equilibrium.

3,890,548
PULSED CAPACITOR DISCHARGE ELECTRIC ENGINE

Edwin V. Gray, Northridge, Calif., assignor to Evgray Enterprises, Inc., Van Nuys, Calif.

Filed Nov. 2, 1973, Ser. No. 412,415
Int. Cl. H02p 5/00
U.S. Cl. 318—139 18 Claims

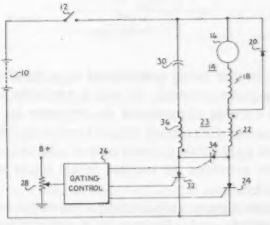
15. An electric engine, comprising:
fixed electromagnets;
movable electromagnets movable into alignment with said fixed electromagnets;
capacitor means;
means for charging said capacitor means; and
means for discharging said charged capacitor means through said fixed and movable electromagnets to polarize said aligned fixed and movable electromagnets for magnetic repulsion.



3,890,549
PULSE CONTROL SYSTEM POWER CIRCUIT

Charles Edward Konrad, Roanoke, Va., assignor to General Electric Company, Salem, Va.

Filed Apr. 1, 1974, Ser. No. 456,465
Int. Cl. H02p 5/16
U.S. Cl. 318—246 10 Claims



1. A pulse control power system for controllably metering power from a DC source to a load, comprising:
a thyristor for coupling the load to a source of DC current;
the series combination of a capacitor, inductive means, and a first unidirectional conducting means, said series combination being adapted to be coupled in parallel with said thyristor and the load;
a second unidirectional conducting means for coupling said capacitor across the load, and poled in a direction opposite to that of said first unidirectional conducting means; and
a gating control for periodically initiating conduction of said thyristor and for subsequently initiating the conduction of one of said unidirectional conducting means to effect commutation of said thyristor.

3,890,550
DIFFERENTIAL AMPLIFIER CIRCUIT FOR SERVO SYSTEM

Hideo Izumi, and Toshikazu Ichiyanagi, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

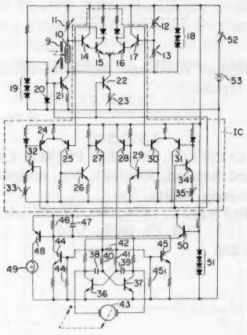
Filed May 25, 1972, Ser. No. 256,819
Claims priority, application Japan, May 28, 1971, 46-36801
Int. Cl. G05f 1/00
U.S. Cl. 318—678 10 Claims

1. An electric circuit for a servo system, comprising:
a first differential circuit to produce a direct-current signal corresponding to a deviation of an input signal from a

reference value to be set, said differential circuit having two output terminals;

two semiconductor switching circuits connected to said output terminals of said differential circuit, respectively, each of said switching circuits including a second differential circuit having a first transistor, the input terminal of which is electrically connected to one of the two output terminals of said first differential circuit, and a second transistor, the input terminal of which is electrically connected to a constant voltage for applying a reference voltage to said second differential circuit and bias level varying means for varying the reference voltage;

an astable multivibrator having at least one output terminal and input terminals electrically connected to the output terminals of said second differential circuits, said astable



multivibrator being constituted so as to produce an alternating pulse current having a variable and reversible direct-current component in response to the output of said second differential circuits and to produce such pulse current only when at least one of said second differential circuits provides an output to an input of said astable multivibrator;

servo control means electrically connected to the output of said astable multivibrator, said servo control means including means for causing the input to said first differential circuit to approximate said reference voltage,

whereby upper and lower limits of a non-sensitive range of said servo control means are controllable by said bias level varying means which varies the reference voltage level and in turn operating points of said second differential circuits.

3,890,551

REGENERATIVE BRAKING CIRCUIT

Allen B. Plunkett, Lawrence Park, Pa., assignor to General Electric Company, Erie, Pa.

Filed Jan. 24, 1974, Ser. No. 436,340

Int. Cl. H02p *3/18*

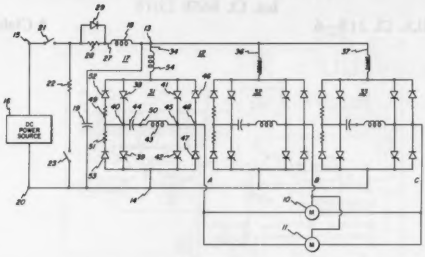
U.S. Cl. 318—376 **15 Claims**

1. A power conversion circuit for connection across a d-c power source comprising:

a. power conversion means having input terminals for connection to said d-c power source and output terminals for connection to a load;

b. commutation means connected to said power conversion means to commutate the current between said input and said output terminals, said commutation means having an increased commutation ability with increased voltage across said input terminals;

c. a dynamo electric machine for connection across said output terminals, said machine being capable of separately performing motoring and generating functions, so as to receive power from said power conversion means during periods of motoring and deliver power thereto during periods of generation;



d. means for increasing the voltage across said input terminals above that which exists at said power source during periods of generation, thereby allowing said commutation means to commutate a greater amount of power during generation than during motoring.

3,890,552

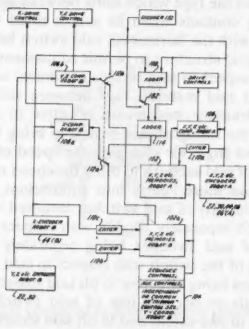
DUAL-ARMED MULTI-AXES PROGRAM CONTROLLED MANIPULATORS

George C. Devol, 990 Ridgefield Rd., Wilton, Conn. 06897, and Paul S. Martin, 189-54 43rd Rd., Flushing, N.Y. 11358

Filed Dec. 29, 1972, Ser. No. 319,360

Int. Cl. G05b *19/42*

U.S. Cl. 318—568 **16 Claims**

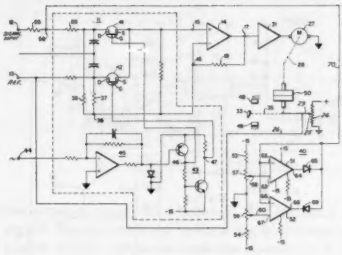


1. In combination, first and second manipulators of like construction having first and second work heads, respectively, for performing complementary operations, said manipulators being disposed in relation to each other for enabling said work heads to perform said complementary operations, said first manipulator including operating means for effecting translation of said first work head through a succession of motions, said operating means having plural actuating means for effecting translation of said first work head along plural coordinates and control means for said actuators including means for providing successive commands, and said second manipulator including second operating means having plural actuating means for effective translation of said second work head through a succession of translations along plural coordinates corresponding to those of the first manipulator, said second operating means being responsive at least indirectly to the successive commands of said first manipulator for positioning said second work head to perform operations complementary to said first work head.

3,890,553
DIRECT COUPLED AMPLIFIER IN NULL BALANCE CIRCUIT OR THE LIKE

Allen M. Diamond, Orange, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Oct. 23, 1973, Ser. No. 408,993
Int. Cl. G05b *5/01*
U.S. Cl. 318—678 **14 Claims**



1. A circuit for achievement of null balance comprising in combination with a signal input terminal and a reference terminal:

switch means with an output terminal intermittently shifted between connection to the signal input terminal and the reference terminal,

a voltage divider connected between the signal input terminal and the reference terminal,

an average voltage terminal connected to an intermediate point on the voltage divider,

a differential amplifier with first and second input terminals and an output terminal, the first being directly connected to the switch means output terminal and the second being connected to the average voltage terminal,

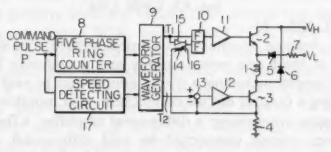
an adjustable-voltage source of reference voltage with adjusting means, said source being connected to said reference terminal, and

driving means responsive to output of said differential amplifier for driving said adjusting means.

3,890,554
SYSTEM FOR DRIVING A PULSE MOTOR

Norito Yoshitake, Hino; Hiroshi Usami; Katsuo Kobari, both of Yokohama; Hiroshi Ishida, and Yoshiki Fujioka, both of Hino, all of Japan, assignors to Fujitsu Limited and Fujitsu Fanuc Limited, Tokyo, Japan

Filed Apr. 18, 1974, Ser. No. 462,131
Claims priority, application Japan, Apr. 26, 1973, 48-47727; Apr. 26, 1973, 48-47728
Int. Cl. H02k *37/00*
U.S. Cl. 318—696 **4 Claims**



1. A system for driving a pulse motor in response to command pulses comprising:

exciting signal generating means for generating polyphase rectangular exciting signals each of which has a predetermined phase difference depending on the speed of said command pulses and poly-phase trapezoid exciting signals each of which has a predetermined phase difference depending on the speed of said command pulses,

controlling means for controlling exciting currents which are supplied to exciting coils of said pulse motor in response to both the poly-phase rectangular exciting signals and the poly-phase trapezoid exciting signals,

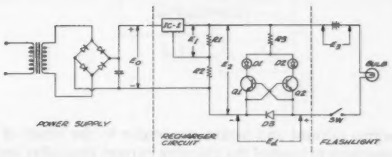
speed detecting means for detecting whether said speed of said command pulses is lower or higher than a predetermined speed, and

means for supplying said poly-phase trapezoid exciting signals to said controlling means when said speed of said command pulses is a low range and for supplying said poly-phase rectangular exciting signals to said controlling means when said speed of said command pulses is in a high range.

3,890,555
BATTERY RECHARGING CIRCUIT WITH INDICATOR LIGHTS

Norman C. Nelson, New Berry Springs, and Daniel C. Harley, Apple Valley, both of Calif., assignors to Kel-Lite Industries, Inc., Barstow, Calif.

Filed Sept. 6, 1973, Ser. No. 394,746
Int. Cl. H02j *7/02;* **F21l** *9/00*
U.S. Cl. 320—2 **3 Claims**



1. A battery recharger comprising:

a regulated D.C. voltage source and a charge control diode coupled together to form a series circuit;

means for coupling said series circuit in a series loop with a battery circuit such that the battery voltage opposes the voltage of said source; and

indicator circuit means coupled across said charge control diode for indicating the charging condition, including both a "CHARGE" indicator light and a "POWER OFF" indicator light;

said indicator circuit means being biased by said control diode when current from said voltage source flows through said series loop to cause said "CHARGE" indicator light to be energized and said "POWER OFF" indicator light to be deenergized; and

said indicator circuit means being biased by said control diode when said voltage source is ineffective and current from said battery flows from said series loop to cause said "CHARGE" indicator light to be deenergized and said "POWER OFF" indicator light to be energized.

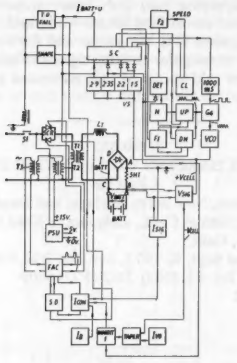
3,890,556
BATTERY CHARGERS

William Gordon Melling; John Stevens; Peter George McLellan; Brian Turton Smith; Richard Gascoine Massey; John Barrington Knight, and Robert Nigel Lang, all of London, England, assignors to Westinghouse Brake & Signal Co. Ltd., London, England

Filed Sept. 24, 1973, Ser. No. 400,001
Claims priority, application United Kingdom, Oct. 14, 1972, 47491/72; Nov. 11, 1972, 52200/72; Apr. 24, 1973, 19464/73
Int. Cl. H02j *7/04*
U.S. Cl. 320—21 **17 Claims**

1. A battery charging control circuit in which the state of battery charge is assessed by measurement when the battery charging current is interrupted and including means operative during an interruption to time a period of time, means responsive to the end of said period to register the battery voltage,

means to compare the registered battery voltage with the battery voltage registered earlier during an interruption of



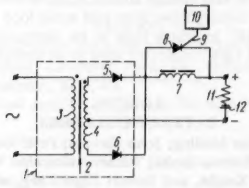
charging current and means responsive to the result of said comparison to control the charging current thereafter applied to the connected battery.

3,890,557

DEVICE FOR SETTING UP ARC CURRENT IN PULSED ARC WELDING

Georgy Yakovlevich Bogdanov, ulitsa Gavrskaya 4, kv. 71; Jury Andreevich Deminsky, ulitsa Lenina 44, kv. 1; Mikhail Isaakovich Zax, ulitsa Shkolnaya 3, kv. 4, and Jury Viktorovich Tsygankov, ulitsa vavilovykh 11/3, kv. 118, all of Leningrad, U.S.S.R.

Filed Nov. 13, 1973, Ser. No. 415,380
Int. Cl. B23k 9/06
U.S. Cl. 321—16 **3 Claims**



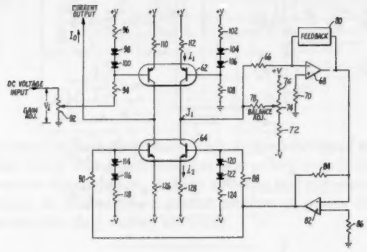
1. A device for setting up an arc current in pulsed arc welding comprising: a rectifier; a choke connected to the output of said rectifier and adapted for smoothing pulsations of rectified current; a controllable valve connected in parallel to said choke and shunting said choke within a pre-set period of pulsation of the rectified current voltage with a delay as to the commencement of the rectified current voltage pulsation period.

3,890,558

VOLTAGE CONTROLLED BI-DIRECTIONAL STABLE SOURCE APPARATUS

Barrett Earl Guisinger, Saratoga, and Bert H. Dann, Mountain View, both of Calif., assignors to International Video Corporation, Sunnyvale, Calif.

Filed Apr. 27, 1973, Ser. No. 355,220
Int. Cl. G05f 3/02
U.S. Cl. 323—4 **2 Claims**



1. Voltage controlled current source apparatus comprising first and second independently amplifying voltage controlled amplifier means, said amplifier means including first and second solid state devices arranged on a single chip,

first and second current source means connected to each of said amplifier means, respectively, for generating respective currents proportional to voltages applied to said amplifier means, said first current source current taken as the output current, said current source means including first and second solid state devices arranged on a single chip,

means for applying a control voltage to said first amplifier means,

means for applying a reference voltage to said second amplifier means,

comparator means receiving the current from said second current source for comparing said second current source current to a reference for generating a comparator error voltage proportional to the difference between said second current source current and said reference, and

means for applying said comparator error voltage to said first and second current source means to drive said second current source current to the level of said reference level whereby said first current source current is stabilized.

3,890,559

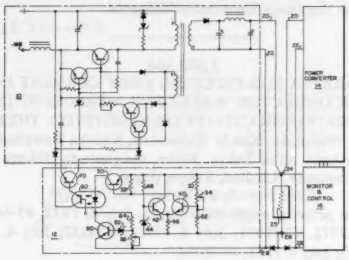
CIRCUIT FOR MONITORING AND CONTROLLING MULTIPLE POWER SUPPLIES

Karl H. Kuster, Glendale Heights, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed May 20, 1974, Ser. No. 471,262
Int. Cl. G05f 1/64
U.S. Cl. 323—21 **8 Claims**

1. A voltage monitor and control system, connected between at least one power supply and a common load, said power supply including a direct connection to said load and including a control circuit connection, said monitor and control system comprising: a differential amplifier, a first voltage reference means connected to said differential amplifier; sensing means, connected between said load and said differential amplifier, operated in response to a voltage change at said load to cause said differential amplifier to generate an output signal proportional in magnitude to said voltage change; isolating means connected to said power supply control circuit connection; amplifying means connected between said isolating means and said differential amplifier; operated in response

to said differential amplifier output signal, to operate said isolating means to extend a control signal to said power supply over said control circuit connection; and a second voltage



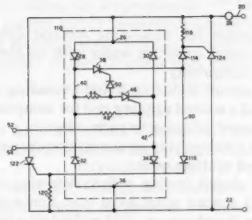
reference means connected between said isolating means and said power supply operated in response to voltage changes at said power supply output to limit the operation of said isolating means beyond a predetermined level.

3,890,560

SOLID STATE ZERO-SENSING CONTROL

Thomas R. Huellinghorst, Florissant, Mo., assignor to Unidynamics/St. Louis, Inc., St. Louis, Mo.

Filed Oct. 24, 1972, Ser. No. 299,937
Int. Cl. H03k *17/56*
U.S. Cl. 323—22 SC **19 Claims**



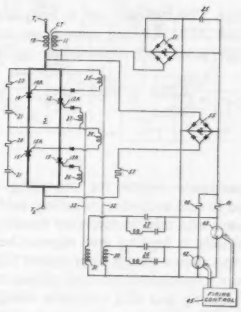
1. A zero-sensing control which is very stable and which comprises a Zero-Crossing signal-sensing SCR, means connecting the anode of said signal-sensing SCR to the positive terminal of a D.C. source which is connected directly in series with a load and conducts a control current which flows thru said load and which recurrently increases the control voltage thereof from essentially zero to a peak value and then permits that control voltage to decrease to essentially zero, second means connecting the cathode of said signal-sensing SCR to the negative terminal of said D.C. source, one of said means including a resistor, (and) a further resistor connected between said positive terminal of said D.C. source and the gate of said signal-sensing SCR, and control SCR, third means connecting the gate-cathode circuit of said control SCR in parallel relation with the anode-cathode circuit of said signal-sensing SCR, whereby said signal-sensing SCR will effectively shunt said gate-cathode circuit of said control SCR and thereby keep said control SCR from becoming conductive whenever said signal-sensing SCR becomes conductive, and a threshold device in said third means, said threshold device being non-conductive whenever said anode-cathode circuit of said signal-sensing SCR is conductive and thereby preventing the flow of "firing" current through said gate-cathode circuit of said control SCR, said threshold device being conductive whenever said anode-cathode circuit of said signal-sensing SCR is non-conductive and thereby permitting the flow of "firing" current through said gate-cathode circuit of said control SCR.

3,890,561

GATE PULSE POWER SUPPLY FOR STATIC ALTERNATING CURRENT SWITCHES

Donald M. Demarest, Wallingford, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Nov. 16, 1973, Ser. No. 416,559
Int. Cl. G05f *1/44*
U.S. Cl. 323—24 **6 Claims**



1. Alternating current static switching apparatus for an electric power circuit comprising, at least one pair of gate controlled semiconductor devices connected in inverse parallel branch circuit relation between a pair of switch terminals, said semiconductor devices each including an anode, a cathode and a gating electrode and said devices being oppositely poled for conduction of opposite half cycles of alternating power current, synchronous gate pulse generating means connected to supply current pulses to said gating electrodes during opposite half cycles when forward voltage exists between the anode and cathode of said devices respectively thereby alternately to render said devices conductive, electric energy storage means for energizing said gate pulse generating means, means responsive to voltage between said switch terminals to supply electric charging current to said energy storage means during non-conductive intervals of switch operation, and means responsive to the flow of power current through at least one of said semiconductor devices to supply electric charging current to said energy storage means during conductive intervals of switch operation.

3,890,562

REGULATED POWER SUPPLY UTILIZING A HALFWAVE SWITCH

Thomas G. West, Fort Wayne, Ind., assignor to General Electric Company, Indianapolis, Ind.

Continuation of Ser. No. 305,715, Nov. 13, 1972, abandoned.
This application Jan. 25, 1974, Ser. No. 436,560
Int. Cl. G05f *1/64*; H02p *13/24*
U.S. Cl. 323—14 **4 Claims**

1. A power supply circuit comprising:

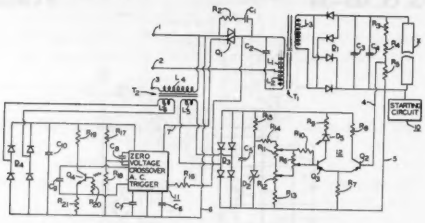
first and second input terminals for connecting said circuit to an AC source;

half wave which means having a pair of conduction electrodes and a control electrode, one of said pair of conduction electrodes being connected to said first input terminal;

gating means connected to said control electrode, said gating means including a zero voltage crossover AC trig-

ger; said trigger including means for sensing the voltage across said half wave switch; said trigger further including means for applying a control signal to said control electrode only near zero voltage crossover for gating on said half wave switch;

a high leakage reactance transformer having a primary winding, an extension winding and a secondary winding; one side of said primary winding being connected to the other of said pair of conduction electrodes; the other side of said primary winding being connected to said second input terminal;



output capacitance means for providing charge storage connected to said secondary winding; said output capacitance means and said transformer drawing input current which initially is lagging and approaches unity as said output capacitance means approaches full charge;

power factor capacitance means connected across said primary winding and said extension winding, said power factor capacitance means drawing leading input current of sufficient magnitude to minimize the overall circuit input current for the total charging time of said output capacitance means, such that the overall circuit input is at times lagging and at times leading.

3,890,563

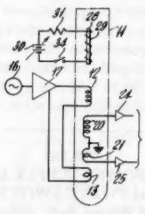
MAGNETIC SUSCEPTIBILITY LOGGING APPARATUS FOR DISTINGUISHING FERROMAGNETIC MATERIALS

Donald J. Dowling, and Kerry D. Savage, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Oct. 24, 1973, Ser. No. 409,203

Int. Cl. G01v *3/10, 3/18*

U.S. Cl. 324—6 **1 Claim**



1. In magnetic susceptibility bore hole logging, the combination comprising

a logging tool,

a transmitter coil on said tool for introducing an AC magnetic field into a surrounding medium,

a receiver coil on said tool and spaced from said transmitter coil for developing a signal that is influenced by said surrounding medium,

unidirectional magnetic-field-generating means mounted on said tool for applying a magnetic saturaing field to said medium,

said last-named means comprising a high-permeability core having a saturation coil wound thereon,

a capacitor connected in circuit with said saturation coil for discharging therethrough,

an electronic switch in circuit with said capacitor for controlling said discharge, and

means including a delay circuit for gating said transmitter coil energization off until transients from said transmitter discharge have been dissipated.

3,890,564

APPARATUS FOR INDUCING EDDY CURRENT IN A SEMICONDUCTOR WAFER FOR MEASURING THE ELECTRIC CONDUCTIVITY OR RESISTIVITY THEREOF

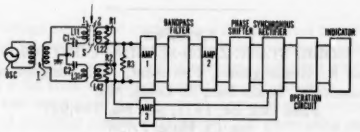
Takashi Watanabe; Koichi Watamura; Kazuya Kawatani, and Hideo Aoki, all of Tokyo, Japan, assignors to Ohkura Electric Company, Limited, Tokyo, Japan

Filed Nov. 3, 1972, Ser. No. 303,594

Claims priority, application Japan, July 4, 1972, 47-66847; July 4, 1972, 47-78931; July 4, 1972, 47-78932; July 4, 1972, 47-78933; July 4, 1972, 47-78934

Int. Cl. G01r *33/12*

U.S. Cl. 324—40 **7 Claims**



1. An apparatus for measuring electric conductivity or resistivity of a semiconductor wafer with no electric contact to said wafer, comprising

an exciting circuit including a first extending coil for measuring, and a second exciting coil for compensating which are connected in series to each other,

an oscillator for supplying an alternating current to said first and second exciting coils,

a detecting circuit having a first detecting coil which is positioned spaced apart from said first exciting coil to form a gap therebetween, said wafer being inserted in said gap for measurement, and a second detecting coil for compensating which is connected in series opposition to said first detecting coil and is magnetically connected to said second exciting coil, thereby a differential output being obtained between each end of said first and second detecting coils,

a pair of U-shaped magnetic cores on which said first coils, respectively, are wound in such arrangement that the ends of each said magnetic core have the same polarity but the opposite polarity with respect to the ends of the other,

a bandpass filter means for eliminating higher harmonics and noise component being provided in an output portion of said detecting circuit,

a phase shifter means operatively connected to said bandpass filter means for shifting the phase of the output of said bandpass filter means by 90° with respect to the phase of the voltage induced in said second detecting coil,

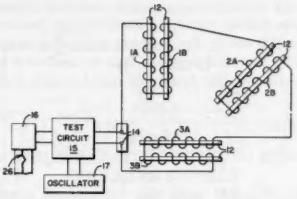
a synchronous rectifier means for rectifying synchronously the output of said phase shifter with reference to the output across said second detecting coil,

an operation circuit means for obtaining an output proportional to the electric conductivity or resistivity of said wafer from the output of said synchronous rectifier means and data concerning the thickness of said wafer, and an indicator means for indicating the output of said operation circuit means.

3,890,565
MEASURING CORE REDUCTANCE

Arthur W. Obenschain, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 25, 1960, Ser. No. 24,634
Int. Cl. G01r *33/02*
U.S. Cl. 324—43 R **4 Claims**

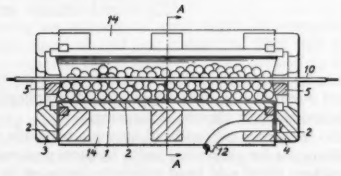


1. A method for measuring the reductance of cores in a total field magnetometer wherein the magnetometer is placed in a constant, unidirectional magnetic field of a predetermined value, the magnetometer comprising three pairs of previously matched orthogonally arranged cores, the first pair of matched cores being parallel to the magnetic field, the second and third pair of matched cores being perpendicular to the magnetic field, which comprises the steps of (1) substituting for one of the cores of the second pair of matched cores a different core which is to be tested, (2) applying calibrated magnetic fields parallel to the first pair of cores to produce a first effect on the magnetometer, (3) rotating the magnetometer 90° from an original position about an axis parallel to the third pair of cores to produce a second effect on the magnetometer, (4) rotating the magnetometer 90° back to the original position thereof and (5) measuring the difference between the first and second effects whereby the difference measurement is indicative of said different core reductance.

3,890,566
METHOD AND AN ARRANGEMENT FOR VOLTAGE TESTING AND DRYING OF ELECTRICALLY INSULATED CONDUCTORS

Sven Sigurd Nordblad, Spanga, and Karl-Erik Svensson, Hagersten, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Jan. 2, 1974, Ser. No. 429,978
Claims priority, application Sweden, Jan. 19, 1973, 73007619
Int. Cl. G01r *31/16;* **F26b** *13/24*
U.S. Cl. 324—54 **8 Claims**



1. A method for voltage testing and drying an extruded or equivalently treated insulated conductor having an inner core of electrically conducting material and an outer insulation which is damp comprising the steps:

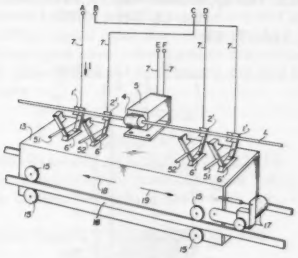
drawing the damp conductor in its longitudinal direction through a chamber, said chamber containing electrically conducting and freely movable spheres and said spheres contacting each other and the insulation of said conductor, and

applying a test voltage across the inner core of the conductor and said spheres while forcing the spheres in said chamber into movement around said insulated conductor so that the moisture on the insulation is transferred to the surfaces of all the spheres for faster evaporation while simultaneously testing the insulation of the insulated conductor.

3,890,567
TEMPERATURE COMPENSATED RESISTANCE MEASURING OF AN ELONGATED ELECTRICAL CONDUCTOR

Manfred Knüfflmann, Dhunnberg 18, Leverlusen-Schlebusch, and Ingo Seidel, Sulzburgerstr. 263, Koln-Sulz, both of Germany

Continuation-in-part of Ser. No. 242,637, April 10, 1972, abandoned. This application Jan. 11, 1974, Ser. No. 432,524
Claims priority, application Germany, Apr. 14, 1971, 2118015
Int. Cl. G01r *27/14*
U.S. Cl. 324—64 **9 Claims**



6. Apparatus for determining the resistance of an elongated conductor while said conductor moves in a path in the direction of elongation thereof comprising:

a. a carrier;
b. guide means for guiding movement of said carrier in said direction adjacent said path;
c. a plurality of contacts mounted on said carrier and spaced in said direction;
d. engaging means for releasably engaging said contacts with said conductor in longitudinally spaced relationship, and for thereby maintaining a conductive connection between said contacts while said conductor moves in said path and said carrier moves in said direction jointly with said conductor; and
e. resistance measuring means for measuring the resistance between two of said contacts while said two contacts move jointly with said carrier and said conductor.

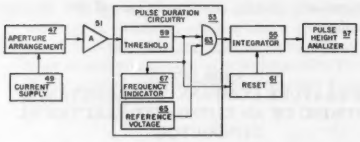
3,890,568
METHOD AND APPARATUS FOR PARTICLE LENGTH MEASUREMENT

Wallace H. Coulter, Miami Springs, and Walter R. Hogg, Miami Lakes, both of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Nov. 6, 1972, Ser. No. 304,127
Int. Cl. G01n *27/00*
U.S. Cl. 324—71 CP **29 Claims**

1. A method for measuring the length of particles of substantially uniform cross-section which have been electronically scanned by a Coulter type of particle scanning aperture arrangement that generates a particle pulse for each scanned particle, the particle pulses having differing amplitudes depending upon particle volume and cross section, said method comprising the steps of: measuring the time duration that each

particle pulse exceeds a known percentage of its maximum amplitude, all particle pulses being measured at the same



percentage value, and converting said time duration to a signal parameter which is a measurement of particle length.

3,890,569

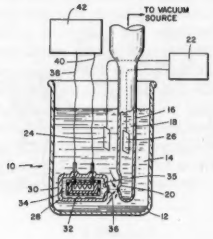
PARTICLE STUDY DEVICE

Walter R. Hogg, Miami Lakes, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Division of Ser. No. 279,436, Aug. 10, 1972, Pat. No. 3,859,012. This application May 24, 1974, Ser. No. 473,127

Int. Cl. G01n *27/00*

U.S. Cl. 324—71 CP **28 Claims**



1. In a particle study device comprising a sensing zone, means for passing a fluid suspension of particles through said sensing zone and means for sensing the presence of the particles within the influence of said sensing zone and for producing a signal in response to each particle sensed, the improvement comprising means for ejecting a specific amount of the fluid sample containing a plurality of particles into a flow stream leading to said sensing zone, said ejecting means including means for receiving and temporarily storing a given amount of sample, a thermal expansion device mounted within said receiving and storing means, and means for supplying a predetermined amount of energy to said thermal expansion device to raise the temperature of said device to cause said device to expand thereby to eject a specific minute amount of fluid sample from said receiving and storing means.

3,890,570

DISTORTION MEASURING DEVICE

Erik Edeling Kristensen, Tastrup, and Stig Glerup Mikkelsen, Herlev, both of Denmark, assignors to Radiometer A/S, Copenhagen, Denmark

Filed May 30, 1973, Ser. No. 365,281

Claims priority, application Denmark, June 6, 1972, 2811/72

Int. Cl. G01r *23/16*

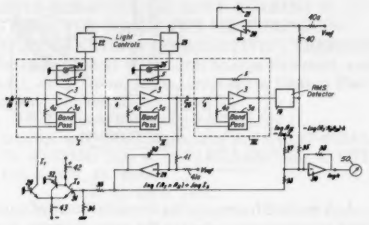
U.S. Cl. 324—77 R **5 Claims**

1. A distortion measuring device for measuring the content of distortion components of an audio frequency signal in relation to a fundamental, comprising

a plurality of series-connected active band stop filters tunable to the frequency of the fundamental, each of said band stop filters comprising an amplifier having a negative feed-back circuit including a band-pass filter, said band-pass filter comprising

integrators and controllable resistors for tuning said band-pass filter,

a phase-sensitive detector having inputs connected to receive said audio frequency signal and a signal representative of said fundamental, respectively, and



control circuit means having an input connected to the output of said phase-sensitive detector for controlling said controllable resistors in said band-pass filter so as to tune said filter to the frequency of the fundamental,

a measuring circuit connected to the filters to derive therefrom signals representing the relative value of the distortion components, and

means for transferring said signal to an indicator device.

3,890,571

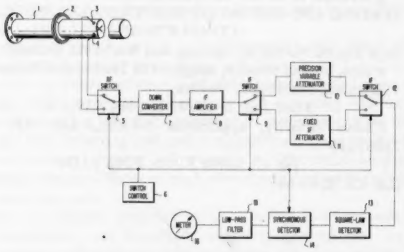
RADIO FREQUENCY POLARIMETER

John P. Beyer, Arlington, Va., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Oct. 17, 1973, Ser. No. 407,358

Int. Cl. G01r *21/12, 29/00*

U.S. Cl. 324—95 **7 Claims**



1. A radio frequency polarimeter for measuring the axial ratio and orientation of the principle axis of elliptically polarized electromagnetic signals, comprising:

a radio frequency pickup head having a rotatable member and means for measuring radio frequency power at two positions about said head angularly displaced by 90°;

a radio frequency switch connected to receive as two inputs the radio frequency power measured at said two positions;

converter means connected to the output of said radio frequency switch for converting radio frequency power to an intermediate frequency power;

a first intermediate frequency switch connected to the output of said converter means and providing two outputs;

a fixed intermediate frequency attenuator connected to one output and a variable attenuator connected to the other output of said first intermediate frequency switch;

a second intermediate frequency switch having two inputs connected respectively to said fixed and variable attenuators;

switch control means connected to said radio frequency switch and said first and second intermediate frequency switches for causing said switches to operate in synchronism, the frequency of said switch control means being greater than the fluctuations in the signal strength of said elliptically polarized electromagnetic signals; and

synchronous detector means connected to the output of said second intermediate frequency switch and providing an output indication proportional to the difference in the power measured at said two positions as modified by the switched gains of said fixed and variable attenuators.

3,890,572

METHOD AND APPARATUS FOR EQUALIZING PHASE-ODULATED SIGNALS

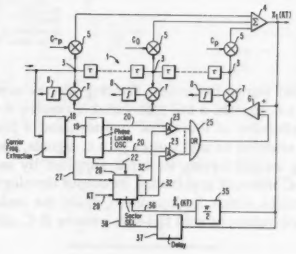
Andre Eugene Desblanche, and Jean Marc Pierret, both of Nice, France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 28, 1974, Ser. No. 437,429

Claims priority, application France, Jan. 31, 1973, 73.04200

Int. Cl. H04l *27/18*

U.S. Cl. 325—42 **12 Claims**



1. A method for equalizing a phase-modulated data signal, which may assume n distinct phase values as transmitted over a transmission medium that introduces linear distortions into the transmitted signals, comprising the steps of:

applying the signal received from the transmission medium to a first transversal filter having a variable transfer function and a plurality of different delay taps, thereby obtaining an equalized signal;

generating an adjustment error signal by comparing the output signal of said first transversal filter with a reference signal at characteristic instants defined by a clock which generates timing signals at the rate at which the data are transmitted; and

adjusting said transfer function of said first transversal filter so as to minimize said adjustment error signal;

said adjustment error signal generating step including the steps of

extracting the carrier frequency from the signal received from the transmission medium;

generating from said carrier frequency n possible reference signals, each of which consists of said extracted carrier frequency exhibiting one of said n distinct phase values;

selecting from said n possible reference signals the particular one which is to be used as a reference signal at a given characteristic instant; and

comparing said first transversal filter output signal with the selected reference signal.

3,890,573

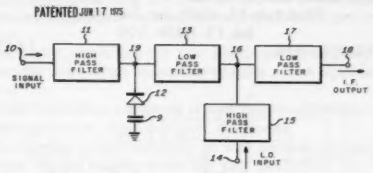
HIGH CONVERSION EFFICIENCY HARMONIC MIXER

Harry F. Strenglein, Clearwater, Fla., assignor to Sperry Rand Corporation, New York, N.Y.

Filed June 10, 1974, Ser. No. 477,943

Int. Cl. H04b *1/26*

U.S. Cl. 325—451 **6 Claims**



1. Harmonic signal mixer means comprising:

high pass signal input filter means,

low pass filter means in series relation with said high pass signal input filter means,

high pass local oscillator signal input filter means in series relation with said low pass filter means,

low pass intermediate frequency signal output means coupled between said low pass filter means and said high pass local oscillator signal input filter means, and

non-rectifying signal mixer circuit means coupled between said high pass signal input filter means and said low pass filter means.

3,890,574

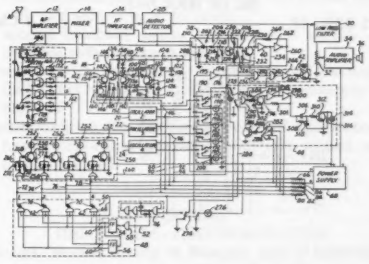
TIME-SHARING SCANNING RECEIVER

Masao Nakano, and Kazuyoshi Imazeki, both of Tokyo, Japan, assignors to General Research of Electronics, Inc., Chicago, Ill.

Filed Sept. 4, 1973, Ser. No. 394,120

Int. Cl. H04b *1/32*

U.S. Cl. 325—470 **13 Claims**



1. A scanning radio receiver which automatically scans a plurality of channels of respective predetermined frequencies, said receiver comprising

an RF section,

variable tuning means for selectively tuning said RF section to said predetermined frequencies,

scanning means for causing said variable tuning means to tune said RF section to each of said predetermined frequencies sequentially and periodically,

channel selection means coupled to said scanning means for producing enabling pulses in synchronism with the tuning of said RF section to a selected one of said frequencies,

signal utilization means for utilizing intelligence received by said RF section, and

enabling means responsive to said enabling pulses for coupling said RF section to said signal utilization means substantially only during the portion of each scanning

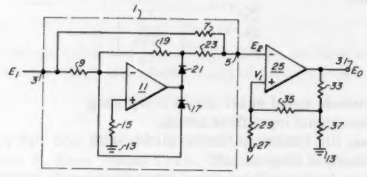
cycle when said RF section is tuned to said selected one of said frequencies.

3,890,575

WINDOW TRIP MONITOR AND COMPARATOR CIRCUIT

David A. Tawfik, Rego Park, N.Y., assignor to The Bendix Corporation, Teterboro, N.J.

Filed July 17, 1969, Ser. No. 842,490
Int. Cl. H03k 5/20
U.S. Cl. 328—146 **14 Claims**



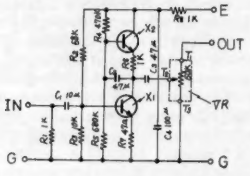
1. A window trip circuit for monitoring a signal and providing a warning indication when the signal amplitude exceeds a trip level, comprising: an absolute value amplifier responsive to the signal for providing a unipolar output having an amplitude corresponding to the amplitude of the signal; means for providing a reference signal corresponding to the trip level; and a level detector for receiving the unipolar output and the reference signal and for providing the warning indication when the amplitude of the unipolar signal exceeds the amplitude of the reference signal.

3,890,576

TRANSISTOR AMPLIFYING CIRCUIT

Kozo Kobayashi, Tokyo, Japan, assignor to Nakamichi Research Inc., Tokyo, Japan

Filed Dec. 26, 1973, Ser. No. 428,334
Claims priority, application Japan, Dec. 27, 1972, 47-4821
Int. Cl. H03f 3/42
U.S. Cl. 330—18 **5 Claims**



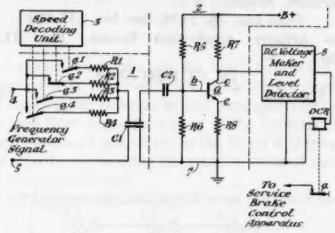
1. A transistor amplifying circuit having input and output means and a power source, comprising a first transistor of grounded emitter type having a base applied with input signal from said input means; a second transistor having an emitter connected to a collector of said first transistor in a D.C. conductive relationship to each other and a collector connected to said power source; bias circuits connected to respective bases of said first and second transistors, one of said bias circuits for said second transistor comprising high impedance elements; a capacitor having a value of capacitance sufficient to provide a relatively lower impedance for an input signal applied to said first transistor and connected between said base of said second transistor and the junction point of said collector of said first transistor and one end of D.C. conductive means with the other end connected to said emitter of said second transistor so that the output signal from said first transistor is substantially shunted from being applied across said base and said emitter of said second transistor; and a variable resistor connected between said collector of said first transistor and a ground to receive and control said output signal from said first transistor and to output the thus controlled signal to said output means, said variable resistor arranged so that the value of resistance between said junction point and said ground can vary whereby the amplitude of the output signal at said output means is substantially proportional to the value of resistance of said variable resistor between said junction point and said ground with the output impedance of said first transistor at said junction point having a value sufficiently higher than the value of resistance of said variable resistor.

3,890,577

VITAL ACTIVE LOW-PASS FILTER

Reed H. Grundy, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Aug. 15, 1973, Ser. No. 388,372
Int. Cl. H03f 3/04
U.S. Cl. 330—31 **10 Claims**



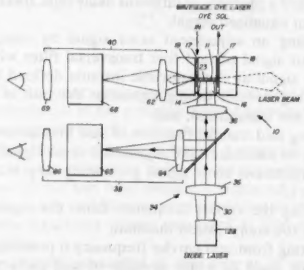
1. A vital signal frequency filtering circuit comprising, a source of a.c. signals, a fail-safe variable passive R-C network having a plurality of individual resistors and a four-terminal capacitor coupled to said source of a.c. signals, and an active amplifying circuit having its input supplied by said fail-safe passive R-C network and having its output developing a range of frequencies which is dependent upon the resistance and capacitance values of said fail-safe passive R-C network.

3,890,578

DYE LASER EXCITED BY A DIODE LASER

Gunnar Wang, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 3, 1973, Ser. No. 421,378
Int. Cl. H01s 3/20
U.S. Cl. 331—94.5 L **17 Claims**



1. A laser comprising:

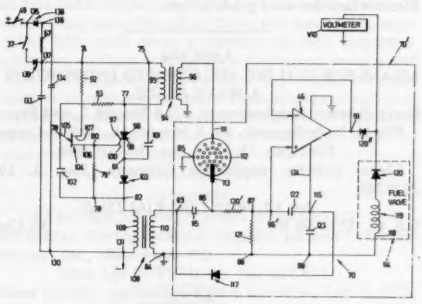
a. semi-conductor means having a junction between N and P type materials which stimulates emission of radiation when electrical current passes therethrough to produce laser radiation;

b. an active liquid medium comprising fluorescent organic dye molecules dissolved in a solvent, said dye molecules having an absorption band at least partially overlapping the emission radiation spectrum of said semi-conductor means;
c. a dye cavity;
d. means for positioning at least a portion of said liquid medium in said cavity;
e. means for directing the laser radiation of said semiconductor means into said liquid medium in said cavity at a power density sufficient to excite a sufficient number of dye molecules to produce a critical population inversion in which radiation is spontaneously emitted and amplified by the excited dye molecules; and
f. means for redirecting a sufficient percentage of the amplified radiation emitted by the excited dye molecules back through said dye cavity to produce laser radiation therein.

3,890,579
IGNITION SYSTEM AND COMPONENTS THEREOF

Elmer A. Carlson, Agoura, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 447,889, March 4, 1974. This application Nov. 25, 1974, Ser. No. 526,586
Int. Cl.[2] H03B *11/10*
U.S. Cl. 331—111 **4 Claims**



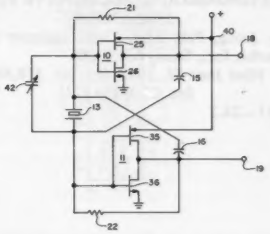
1. An oscillator comprising: first, second and third junctions; a source of D.C. potential having positive and negative leads; first and second inductor means; a capacitor; a silicon-controlled rectifier (SCR) having an anode, a cathode and a gate; and a diode, said positive lead being connected to said first junction, said first inductor means being connected from said first junction to said SCR anode, said capacitor being connected between said first and second junctions, said SCR cathode being connected to said second junction, said diode being connected between said second and third junctions and being poled to be conductive toward said third junction, said second inductor means being connected from said third junction to said negative lead, said SCR gate being connected from said third junction.

3,890,580
TWO PHASE OSCILLATOR

Harry A. Kuhn, Jr., Phoenix, Ariz., and Donald D. Schendel, Jr., North Palm Beach, Fla., assignors to Motorola, Inc., Chicago, Ill.

Filed Dec. 27, 1973, Ser. No. 428,932
Int. Cl. H03b *5/36*
U.S. Cl. 331—116 R **9 Claims**

1. A two phase oscillator circuit comprising complementary metal oxide silicon (CMOS) field-effect transistors including in combination:
first and second voltage supply terminals for connection to first and second levels, respectively, of direct current potential;
a first field-effect transistor of a first conductivity type, having source, drain and gate electrodes;
a second field-effect transistor of a second conductivity type, having source, drain and gate electrodes;
means interconnecting the drain electrodes of said first and second field-effect transistors to form a first output terminal;
means interconnecting the gate electrodes of said first and second field-effect transistors to form a first input terminal;
a third field-effect transistor of said first conductivity type, having source, drain and gate electrodes;
a fourth field-effect transistor of said second conductivity type, having source, drain and gate electrodes;

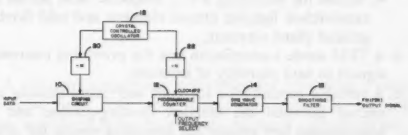


means interconnecting the drain electrodes of said third and fourth field-effect transistors to form a second output terminal;
means interconnecting the gate electrodes of said third and fourth field-effect transistors to form a second input terminal;
frequency determining circuit means coupled in circuit between said first and second input terminals;
a first feedback circuit coupling said first output terminal with said second input terminal;
a second feedback circuit coupling said second output terminal with said input terminal;
means coupling said source electrodes of said first and third field-effect transistors with said first voltage supply terminal; and
means coupling the source electrodes of said second and fourth field-effect transistors with said second voltage supply terminal.

3,890,581
DIGITAL FM (FSK) MODULATOR

Richard L. Stuart; Arvind M. Bhopale, both of Beltsville, and Paul E. Treynor, New Carrollton, all of Md., assignors to Rixon Inc., Silver Spring, Md.

Filed Dec. 27, 1972, Ser. No. 318,750
Int. Cl. H04l *27/12*
U.S. Cl. 332—11 R **9 Claims**



1. A digital FM (FSK) modulator comprising means for generating a clocking signal, variable frequency divider means connected to receive said clocking signal and providing division thereof at a rate which varies in accordance with the data

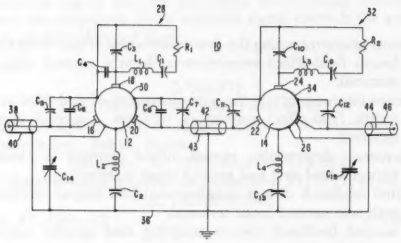
input to the modulator so as to produce a first frequency output responsive to a first data state and a second frequency output responsive to a second data state, and shaping circuit means, connected to receive the data input and including logic circuit means, for sensing when the data changes state and for producing a predetermined variable duty cycle digital output sequency responsive thereto, said variable frequency divider means including counter means connected to the output of said shaping circuit means, the frequency output of said counter means varying in accordance with said digital output sequence so as to provide a gradual change in the frequency of the modulator between the frequency corresponding to the previous data state and the frequency corresponding to the new data state during a predetermined transition period.

3,890,582

FLOATING-GROUND MICROWAVE FERRITE ISOLATORS

David Hoy Jeong, Palo Alto, Calif., assignor to Addington Laboratories, Inc., Sunnyvale, Calif.

Filed June 15, 1973, Ser. No. 370,580
Int. Cl. H01p *1/32*
U.S. Cl. 333—24.2 **3 Claims**



1. A broadband microwave isolator comprising:

a. a plurality of individual floating-ground ferrite-type isolators connected in series, each having a different center frequency and wherein the bandwidths of individual isolators having adjacent center frequencies are overlapping; and wherein each of said individual floating-ground isolators comprises:

1. a lumped circuit element;
2. a pair of ferrite discs sandwiching said lumped circuit element;
3. a floating-ground plane element; and
4. means for providing a d.c. magnetic field across said sandwiched lumped circuit element and said floating-ground plane element;

b. a TEM mode transmission line for providing microwave signals to said plurality of isolators;

c. a variable capacitance for each individual isolator connected between the isolated floating-ground and the transmission line ground for providing means for adjusting the capacitance therebetween; and

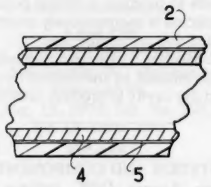
d. including means for compensating for unequal magnetic fields across said lumped circuit element and said floating-ground plane element comprising a tapered nonmagnetic shim located between said magnetic field means and said ferrite discs.

3,890,583

FLEXIBLE CIRCULAR WAVEGUIDE UTILIZING HELICAL WINDINGS

Jacques Bendayan, Lyon, France, assignor to Les Cables de Lyon, Lyon Cedex, France

Filed Feb. 26, 1974, Ser. No. 446,040
Claims priority, application France, Feb. 26, 1973, 73.06734
Int. Cl. H01p *3/14*
U.S. Cl. 333—95 A **10 Claims**



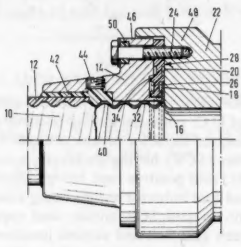
1. A circular wave guide consisting of a helical winding in contiguous turns of a conductor wire having a quadrangular cross-section with oblique and parallel sides and being coated with an insulating sheathing material, whereby certain turns are prevented from parting with the cylinder which they constitute when the wave guide is bent.

3,890,584

MEANS FOR SEALING THE CRIMPED END PORTION OF A WAVE GUIDE

Georg Spinner, Erzgiessereistr. 33, 8 Munich 2, and Franz X. Pitschi, Nederlingerstr. 44, 8 Munich 19, both of Germany

Filed July 13, 1973, Ser. No. 379,054
Claims priority, application Germany, Aug. 3, 1972, 2238268
Int. Cl. H01p *1/04*; F16j *15/10*
U.S. Cl. 333—98 R **10 Claims**



1. Means for securing the crimped end of a wave guide, comprising:

a wave guide comprised of an annular, tubular conductor, said conductor having an end portion that is to be crimped and secured;

an attachment part; a separate conductor part for serving as a continuation of said conductor; said attachment part and said conductor part having respective opposed end faces defining an annular gap therebetween, said attachment part and said conductor part being oriented and positioned such that said conductor end portion is crimped so as to be oriented to extend generally radially outwardly of said conductor and said conductor end portion is in said gap between said opposed end faces;

a flexible, membrane-like, annular sealing element in said gap; said sealing element having a radially more inwardly located annular sealing land extending around it and

extending axially of said conductor toward said conductor part end face; said sealing element also having a radially more outwardly located annular sealing land extending around it and extending axially of said conductor toward said conductor part end face; said inward and said outward lands being spaced apart radially a first distance; both said sealing element lands project both toward said conductor part from one side of said sealing element and toward said attachment part from the opposite side of said sealing element;

said conductor end portion being of a length such that it extends radially outward so as to be between said inward land and said conductor part end face; said conductor end portion having an end edge and said end portion being of a length such that said end edge is between said inward and said outward lands;

the lengths axially of said conductor of said lands on the said attachment part side of said sealing element are greater than the lengths axially of said conductor of the respective said lands on said conductor part side of said sealing element; said sealing element being of a thickness and said lands being of a length axially of said conductor on said conductor part side of said sealing element and said sealing elements having such flexibility that said inward land clamps said conductor end portion against said conductor part end face and said outward land clamps against said conductor part end face without contacting said conductor end portion;

said first radial distance between said inward and outward lands being great enough to cause said lands to be separated from each other a distance at their respective clamping surfaces with said conductor end portion and with said conductor part end face to provide such clearance as to maintain the recited relationship of said conductor end portion with said inward and outward lands despite normal non-uniformity of said radial length of said conductor end portion.

3,890,585

ELECTRICAL SWITCHING APPARATUS

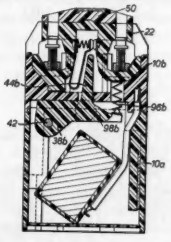
Robert William Hartop, Bedford, England, assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Apr. 4, 1974, Ser. No. 457,812

Claims priority, application United Kingdom, Apr. 5, 1973, 16457/73

Int. Cl. H01h *1/12*

U.S. Cl. 335—198 **9 Claims**



1. An electrical switching apparatus comprising:

a. a contact set including a pair of contact members and biasing means resiliently biasing said contact members towards each other;

b. a body member recessed to receive said contact set in first and second angular senses;

c. an actuator member for said contact members; and

d. mounting means which mounts said actuator member in said body member for displacement from one to another sense to actuate said contact members so that said contact members are separable, when said contact set is received by said body member in one of its two angular senses in response to displacement of said actuator into one of its respective senses.

3,890,586

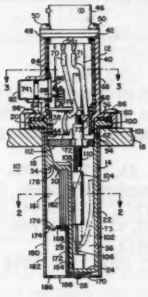
TEMPERATURE RESPONSIVE ELECTRIC SWITCH

Ward Barry Krause, Alexander, N.C., assignor to Square D Company, Park Ridge, Ill.

Filed May 28, 1974, Ser. No. 473,596

Int. Cl. H01h *37/58*

U.S. Cl. 335—208 **10 Claims**



1. A temperature responsive electric switch comprising: a pair of magnetically responsive contacts movable to an operated position in response to magnet flux, a permanent magnet having a pair of opposite polarity magnet poles at its opposite ends and a pair of walls extending between the ends with a first of said walls facing and spaced from the contacts and a second of said walls spaced from the first wall and facing away from the contacts, and a plurality of plates formed of ferromagnetic material having selected magnetization characteristics with each of the plates having an edge engaging the second wall and providing a shunt path for magnet flux when the temperature of the plates is less than the Curie temperature.

3,890,587

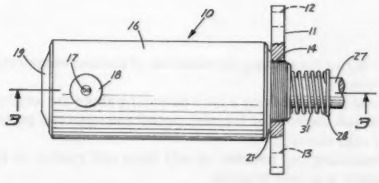
PLUNGER SOLENOID

William J. Field, Minneapolis, Minn., assignor to Laketown Manufacturing Corporation, Inc., Waconia, Minn.

Filed Apr. 1, 1974, Ser. No. 456,558

Int. Cl. H01f *3/12*

U.S. Cl. 335—255 **25 Claims**



1. A solenoid comprising: coil means for producing a magnetic field, fixed pole piece means surrounded by the coil means, said fixed pole piece means having a cylindrical portion with a generally uniform diameter surrounded by the coil means, housing means accommodating the coil means and holding the fixed pole piece means at one end section of the coil means, plunger means movable from an extended position to a contracted position relative to the fixed pole piece means in response to energization of the coil means, said plunger means having a cross sectional area smaller than the cross

sectional area of the cylindrical portion of the fixed pole piece means, and means of ferromagnetic material located between the coil means and plunger means to provide a path for leakage fluxes and minimize useless flux passage through the plunger means, said means of ferromagnetic material including a ferromagnetic sleeve surrounding a section of the plunger means when the plunger means is in the extended position, said sleeve being mounted on the housing means and extended toward the fixed pole piece means, said sleeve having an end longitudinally spaced from the fixed pole piece means a longitudinal distance greater than the longitudinal distance between the end of the plunger means and the fixed pole piece means, said coil means surrounding said sleeve.

3,890,588

WATER JACKET TEMPERATURE SENSOR

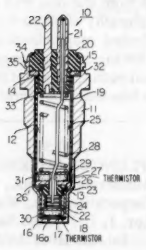
Iwao Kanaya; Kazuo Ishikawa, and Hideo Mifune, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Oct. 23, 1973, Ser. No. 408,948

Claims priority, application Japan, Oct. 26, 1972, 47-123675; Dec. 13, 1972, 47-143504; Dec. 13, 1972, 47-143505; Dec. 13, 1972, 47-143506; Feb. 19, 1973, 48-21419; May 21, 1973, 48-59952

Int. Cl. H01c *7/00;* **G01k** *7/00*

U.S. Cl. 338—28 **9 Claims**



1. A device for sensing the variation of coolant temperature, comprising:

a metal housing having a bore extending along the longitudinal axis thereof and forming closed and open end portions of said housing;

an insulating cap member at said open end portion to fluid tightly seal said housing;

a plurality of thermal resistive elements disposed in spaced parallel relationship to each other in said bore and each having a major dimension extending transversely to said longitudinal axis;

a plurality of insulating means alternately arranged with said thermal resistive elements for electrically insulating said thermal resistive elements from each other;

a plurality of means, axially arranged in contact with said thermal resistive elements, for urging said elements toward said closed end portion of the bore; and

means for conducting current between said thermal resistive elements respectively and the outside of said housing.

3,890,589

VARIABLE RESISTOR

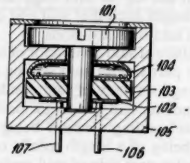
Masanori Kogo, and Hisashi Honda, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 267,630, June 29, 1972, Pat. No. 3,760,322. This application June 20, 1973, Ser. No. 371,620

Claims priority, application Japan, June 30, 1971, 46-48316The portion of the term of this patent subsequent to Sept. 18, 1990, has been disclaimed.

Int. Cl.² H01C *10/04, 10/26*

U.S. Cl. 338—89 **3 Claims**



1. A variable resistance attenuator comprising an input terminal, an output terminal, a common terminal, a first variable resistor connected between said input terminal and said output terminal, first and second resistors connected in series between said input terminal and said output terminal, and a second variable resistor connected to the series connection between said first and second resistors and connected at its opposite terminal to said common terminal, said first and second variable resistors each comprising an electrically resistive element, the incremental resistance of which varies along its length, to form a gradient of resistivity, and two brushes spaced apart by a constant distance in slidable contact with each said resistive element, said gradient being such that the resistance between the brushes varies logarithmically, but the inductance between them remains substantially constant as they are moved with respect to the gradient.

3,890,590

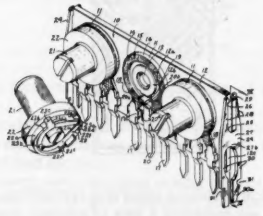
VARIABLE RESISTANCE CONTROL

John D. Van Benthuysen, and Jack A. English, both of Elkhart, Ind., assignors to CTS Corporation, Elkhart, Ind.

Division of Ser. No. 620,186, March 2, 1967, Pat. No. 3,421,133. This application May 27, 1968, Ser. No. 732,137

Int. Cl. H01c *5/02*

U.S. Cl. 338—174 **5 Claims**



1. A variable resistance control comprising a base of electrically nonconductive material provided with an opening and having a front side and a rear side, means defining an arcuate resistance path on the front side of the base and equally spaced around the opening, collector means secured to the front side of the base and equally spaced from the first-mentioned means, said collector means being provided with a hole axially aligned with the opening, an annular track provided on the base between the resistance path and the collec-

tor means, said track being provided with a cut out portion, a center terminal connected to said collector means, a U-shaped terminal portion disposed in the cutout portion and having a pair of legs, one leg of the terminal portion being connected to the center terminal and the other leg being connected to the collector means, disposing of the terminal portion in the cut out portion providing an uninterrupted path on the track, a shaft passing through the hole and journaled in the opening, a driver connected to the shaft, a contactor adapted to wipe both of the means and constrained to rotate with the driver, a skirt integral with the driver slidable on the annular track, a stop member integral with the center terminal, and stop means carried by the driver engageable with the stop member for limiting angular rotation of the driver.

3,890,591
GROUPING OF ELECTRO-ACOUSTIC TRANSDUCERS PARTICULARLY FOR USE IN UNDERWATER DETECTION SYSTEMS

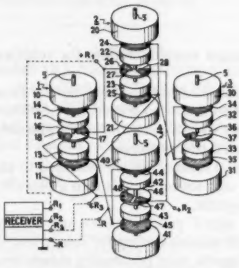
Francois Bocquillon, and Roger Massiera, both of Paris, France, assignors to Thomson-CSF, France

Filed Feb. 21, 1974, Ser. No. 444,649

Claims priority, application France, Feb. 22, 1973, 73.06565

Int. Cl. G01s *3/80*

U.S. Cl. 340—6 R **10 Claims**



1. A grouping of electro-acoustic transducer units into a directional array, wherein each said unit comprises: a front metal plate and a back metal plate, at least two piezoelectric wafers with two opposing parallel faces provided with electrodes forming an active part, termed the driver, stacked between said front and back metal plates of said transducer and wherein at least one of said electrodes comprises conductive areas formed by electrically insulated sectors which divide said electrode into a plurality of separate sub-electrodes located in identical cross section planes of said wafers.

3,890,592
CONTACTLESS CONTROL SYSTEM FOR VOLUME CONTROL AND POWER ON-OFF CONTROL

Sadafumi Kitamura, Neyagawa, and Toshiji Kanamaru, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed July 31, 1972, Ser. No. 276,737

Claims priority, application Japan, Aug. 10, 1971, 46-60721; Nov. 12, 1971, 46-106218

Int. Cl. H04b *11/00;* **H04n** *5/44*

U.S. Cl. 340—15 **4 Claims**

1. A contactless control system for volume control and for on-off controlling power source which comprises:

means for generating first and second signals containing information for volume control and power source on-off control;

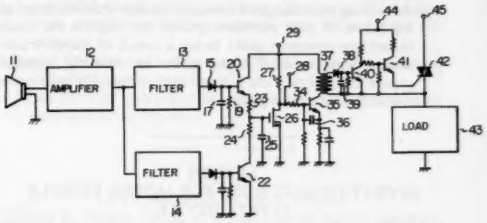
means for receiving each signal to produce a D-C voltage corresponding to the duration of said signal and memorize the voltage thus produced, wherein said receiving and memorizing means comprises a capacitor;

means to charge said capacitor by one of said two signals;

means to discharge said capacitor by the other signal;

a sound amplifier coupled to said memorizing means for amplifying a sound input signal and whose amplification degree is controlled by said D-C control signal for volume control;

a semiconductor switching element connected between a power source and a load; and



means to on-off control said switching element in response to said D-C control signal, including

an oscillator rendered operative when the level of said D-C control signal is at a predetermined level and a rectifying and smoothing circuit for rectifying and smoothing the output of said oscillator, the output of said rectifying and smoothing circuit being impressed on the gate electrode of said semiconductor switching element, said predetermined level of said D-C control signal corresponding to the minimum amplification degree of said sound amplifier.

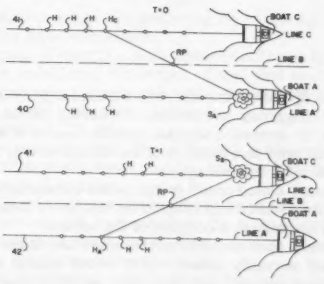
3,890,593
MULTI-DIRECTIONAL SEISMIC EXPLORATION METHODS ON NAVIGABLE WATER

JLee Davis, Ector, Tex., assignor to Advance Oil and Gas Co., Inc., Midland, Tex.

Continuation-in-part of Ser. No. 145,811, May 21, 1971, Pat. No. 3,746,122. This application June 28, 1973, Ser. No. 374,497

Int. Cl. G01v *1/28*

U.S. Cl. 340—15.5 MC **2 Claims**



1. A method for conducting a seismic exploration in a region of interest covered by navigable water comprising:

traversing said region of interest with two vessels on generally parallel courses on either side of and along a planned survey line, said vessels being aligned generally abreast and moving at substantially equal speeds, each vessel towing a string of hydrophones having hydrophones spaced uniformly therealong;

alternately creating seismic disturbances in the water adjacent one vessel and the other at times selected with regard to the speed of the vessels and the spacing of said hydrophones to produce said disturbances at intervals

spaced, in the direction of said traverse, at distances substantially equal to the spacing of said hydrophones, whereby to generate multiple signals from common reflecting points along a line deviating from the planned survey line less than the deviations of said vessels and of their strings of hydrophones from their planned courses caused by water currents and navigational errors;

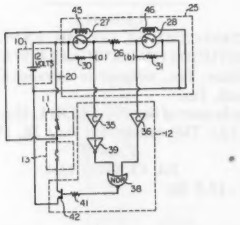
recording substantially all reflections received by said hydrophones;

and stacking recordings of multiple signals received from at least one of said common points, the signals for each respective common point being a result of waves transmitted and received along paths in different vertical planes intersecting on a vertical line through said each respective common point.

3,890,594
OPERATION RECORDER FOR MOTOR VEHICLE SAFETY DEVICE

Akio Hosaka; Kosaku Baba, both of Yokohama, and Kiyoshi Wazawa, Fujisawa, all of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Dec. 13, 1972, Ser. No. 314,523
Claims priority, application Japan, Feb. 9, 1972, 47-14118
Int. Cl. G08b *21/00*
U.S. Cl. 340—52 H **2 Claims**



1. An operation recorder, which is used with a vehicle safety device triggering mechanism connected across a power source, to determine whether a safety device of a vehicle is actuated prior to a collision of the vehicle or not, said operation recorder comprising:

normally closed on/off switch means connected across said power source and adapted to reverse its switch position in response to a collision of the vehicle;

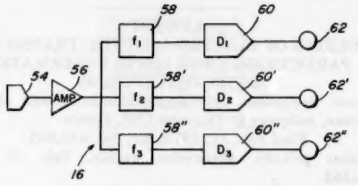
normally open on/off switch means connected in series with said normally closed on/off switch means across said power source, and including switch triggering means connected to said vehicle safety device triggering mechanism and adapted to detect the actuation of the safety device to reverse the switch position of said normally open on/off switch means;

recording means connected in series with said normally closed and normally open on/off switch means and responsive only to the actuation of said normally open on/off switch means prior to the actuation of said closed on/off switch means, thereby to record the sequence of the actuations of said normally closed and normally open on/off switch means, whereby said operation recorder is capable of recording whether said safety device is actuated prior to the collision of the vehicle.

3,890,595
ALARM SYSTEM FOR PNEUMATIC TIRES

William A. Barabino, North Reading, Mass., assignor to Safety Research & Engineering Corporation, North Reading, Mass.

Division of Ser. No. 145,624, May 21, 1971, Pat. No. 3,738,308. This application June 6, 1973, Ser. No. 367,393
Int. Cl. B60c *23/00*
U.S. Cl. 340—58 **5 Claims**



1. A tire pressure warning system for vehicles, comprising in combination

a. an air actuated sound emitting device mounted to said tire and adapted to emit a plurality of different predetermined sound signals according to a plurality of different predetermined tire pressures,

b. a sound signal sensing device mounted to said vehicle for converting said sound signals into a plurality of different electrical signals,

c. electrical signal processing means connected to said sound signal sensing device for selectively detecting said electrical signals, said processing means including a plurality of electrical filters each tuned to a different frequency and,

d. multiple output alarm means connected to said processing means for generating a distinctive alarm signal in accordance with the particular signal detected.

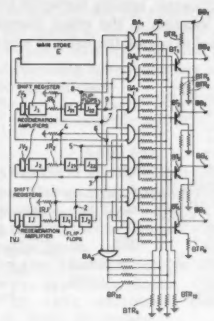
3,890,596
METHOD OF AND DEVICE FOR DETERMINING SIGNIFICANT POINTS OF CHARACTERS

Mattijs Beun, and Pieter Reijnierse, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 196,936, Nov. 9, 1971, abandoned. This application June 5, 1973, Ser. No. 367,168
Claims priority, application Netherlands, Nov. 12, 1970, 7016537
Int. Cl. G06k *9/12*
U.S. Cl. 340—146.3 MA **5 Claims**

1. A method of determining significant points of characters comprising the steps of imaging a character on a two dimensional regular pattern of positions, deriving digital information to distinguish a character position from a background position, determining by the use of information stored in a machine memory which character positions are associated with associated skeleton characters of said characters, said skeleton characters comprising stroke elements consisting of a single series of character positions which succeed each other in accordance with an adjacency criterion, each position having at least six adjacent positions forming a ring thereabout, counting, by the use of appropriate machine elements, the number of times a character position is directly followed

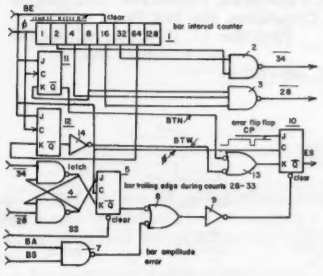
by a background position during a cycle of the at least six positions of said ring around a character position, and determining from said number the number of stroke elements which start from this character position.



3,890,597
BAR GEOMETRY VERIFICATION SYSTEM FOR BAR-CODED CHARACTERS

Leland J. Hanchett, Winchester, Mass., assignor to Taplin Business Machines Incorporated, Burlington, Mass.

Filed Sept. 17, 1973, Ser. No. 398,135
Int. Cl. G06k 9/18
U.S. Cl. 340—146.3 Z 3 Claims

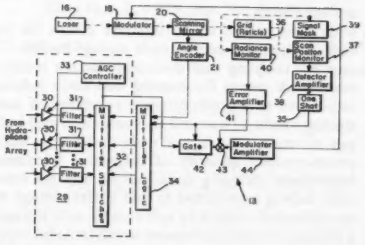


1. A system for the verification of the geometry of bar coded characters including
   a. a clocked bar interval counter;
   b. a bar edge signal carrying line connected to said counter to restart the bar interval count of said counter at each bar edge signal carried by said line;
   c. a clocked too narrow flip-flop set by each bar edge signal carried by said line and reset by a relatively low count of said counter;
   d. a clocked too wide flip-flop set by each bar edge signal carried by said line and reset by a relatively high count of said counter;
   e. an OR-gate combining the output of said too narrow flip-flop and said too wide flip-flop;
   f. an error flip-flop set by a character presence signal and reset by the output of said OR-gate;
   g. clocked first logic circuitry controlled by said counter for generating a signal when a bar edge signal occurs during a period from a time when the count of said counter equals a first number exceeding said relatively low count to a time when the count of said counter equals a second number smaller than said relatively high count, said first logic circuitry being connected to said error flip-flop to clear said error flip-flop by said signal;
   h. a second logic circuitry for sensing voltage errors caused by insufficient bar height connected to said error flip-flop to clear said error flip-flop in response to said voltage errors;
   i. a second OR-gate for combining the output of said first logic circuitry and the output of said second logic circuitry;
   j. said OR-gate and said second OR-gate being implemented by a first and second NAND-gate; and
   k. an inverter interposed between said second NAND-gate and said error flip-flop.

3,890,598
OPTICAL SIGNAL PROCESSOR

William B. Hagen, Northridge, and Morton Rudin, Gardena, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Oct. 26, 1970, Ser. No. 84,064
Int. Cl. G01s 3/80
U.S. Cl. 340—6 R 3 Claims

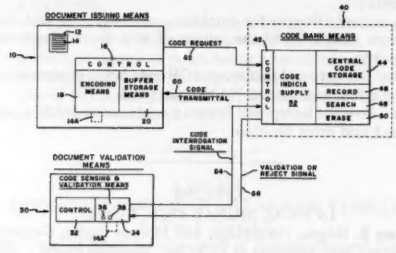


1. An optical processor for processing the output signals of a hydrophone array comprising:
   a first source of monochromatic spatially coherent light;
   means for modulating the output of said first source of monochromatic spatially coherent light with the output signals of said hydrophone array;
   a photosensitive film strip;
   means for exposing said film with said modulated first source of monochromatic spatially coherent light including an optical encoder;
   said optical encoder causing the film to be exposed so that the output of each hydrophone in the array is recorded along a separate track on said film;
   means for developing said exposed film;
   means for illuminating said developed film with a second source of monochromatic spatially coherent light;
   means for projecting the image on said film illuminated by said second source of monochromatic spatially coherent light through a fourier transform lens to obtain the fourier transform of said images;
   means for optically detecting said fourier transform of said images; and
   means for commutating said detected image to separate the detected signals into a plurality of separate electrical signals, each signal corresponding to the output of a single hydrophone; whereby
   further processing of said separate electrical signals may be accomplished.

3,890,599
ARRANGEMENT FOR PROTECTING AND AUTHENTICATING A DOCUMENT

Luther G. Simjian, Greenwich, Conn., assignor to Command Automation, Inc., Greenwich, Conn.

Filed Sept. 13, 1973, Ser. No. 396,687
Int. Cl. G07f 7/02
U.S. Cl. 340—149 R 10 Claims



1. An arrangement for protecting and authenticating a document comprising:

a document issuing means which includes means for encoding a document, a buffer storage means adapted to store codes, and control means for causing a document in operative engagement with said encoding means to be encoded with code indicia withdrawn from said buffer storage means;

a code bank means which includes means for providing code indicia, and central code storage means;

means for coupling said document issuing means to said code bank means for causing said code indicia supply responsive to a predetermined condition of said buffer storage means to transmit and enter into said buffer storage means a plurality of code indicia for encoding a predetermined quantity of respective documents with individually differing code indicia, and for causing the code indicia transmitted to said buffer storage means to be entered and stored by said central code storage means;

a document validation means which includes input means for providing a signal responsive to code indicia disposed on a document;

means coupling said document validation means to said code bank means for providing, responsive to the operation of said input means, to said code bank means an interrogation signal, and responsive to the presence of said code indicia in said central code storage means providing a document validation signal to said document validation means, and

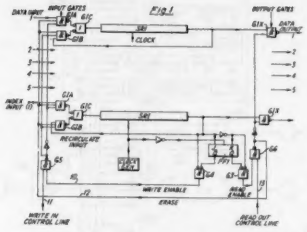
means for controlling said central code storage means for erasing responsive to the initiation of said validation signal the respective code indicia from said central code storage means.

3,890,600
BUFFER STORES

Francis G. Roche, London, England, assignor to Cable & Wireless Limited of Smale House, London, England

Filed Dec. 7, 1973, Ser. No. 422,514
Claims priority, application United Kingdom, Dec. 11, 1972, 57074/72
Int. Cl. G11c 21/00
U.S. Cl. 304—172.5 4 Claims

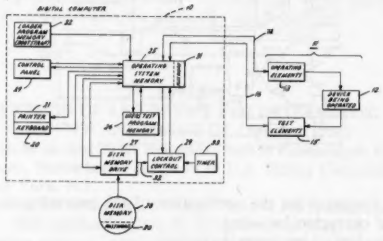
1. A method of controlling the entry and removal of characters from a recirculating buffer store having a plurality of data storage channels within which the respective bits or elements of a multi-bit character entered into the store are circulated, the method comprising entering an index bit of the same given polarity into an index storage channel each time the bits of a character are entered into the respective data storage channels such that the number of index bits accumulated in the index channel always corresponds to the number of data bits accumulated in each data channel, the index channel having the same number of bit locations as the data channels, recirculating the bits in the index channel in synchronism with the bits in the data channels, sensing the signal level at the output of the final bit location in the index channel, generating a write enable signal to permit the entry of a new character into the store only in response to a transition of the sensed index signal level in a first direction, and generating a read enable signal to permit the removal of a character from the store only in response to an index signal level transition in the opposite direction whereby a block of bits of the same polarity and occupying adjacent bit locations is accumulated in the index channel, the leading and trailing edges of the block controlling the removal and entry of characters from and into the store respectively.



3,890,601
PASSWORD OPERATED SYSTEM FOR PREVENTING UNAUTHORIZED OR ACCIDENTAL COMPUTER MEMORY ALTERATION

John P. Pietrolewicz, Pennsauken, N.J., assignor to Philco-Ford Corporation, Blue Bell, Pa.

Filed Mar. 11, 1974, Ser. No. 449,835
Int. Cl. G06f 13/04
U.S. Cl. 340—172.5 9 Claims



1. In a digital computer used to control the operation of a machine, said computer including, a high-speed operating system memory adapted to contain the computer system operating programs, a high-speed program memory adapted to contain at least one of a plurality of the programs used to operate said machine, input and output means for operating and observing the operation of said computer, a low-speed memory device having replaceable easily stored permanent memory elements, said low-speed memory device being capable of storing substantially more information than said high-speed memories thereby permitting storage of said plurality of programs along with the operating system programs and having a protected portion wherein stored information cannot be altered by said computer, said protected portion containing a

password that is unique to each one of said memory elements, and means for transferring information between said high-speed memories and said low-speed memory; an automatic lockout device comprising:

means for comparing the password in said high-speed operating system memory and the password in said low-speed memory, and means to prevent alteration of information in said low-speed memory when the passwords in said high-speed operating system memory and said low-speed memory do not match.

3,890,602
WAVEFORM PRODUCING DEVICE

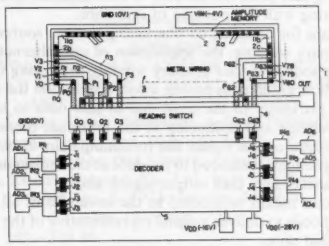
Norio Tomisawa, Hamamatsu; Yasuji Uchiyama, Hamakita; Takatoshi Okumura, and Toshio Takeda, both of Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan,

Filed Oct. 23, 1973, Ser. No. 408,430

Claims priority, application Japan, Oct. 25, 1972, 47-106945; Oct. 25, 1972, 47-106946; Oct. 25, 1972, 47-106947; Oct. 25, 1972, 47-106948

Int. Cl. G11c *11/40*

U.S. Cl. 340—173 R **8 Claims**



1. A waveform producing device which comprises,

a. a resistor zone of a diffused layer formed on a semiconductor substrate and having a plurality of connection points,

b. means for applying a predetermined voltage across the resistor zone so that different potentials appear at the respective connection points, and

c. a reading circuit for reading the different potentials at the connection points in a predetermined order, so that a waveform having variation of amplitudes corresponding to variation of the potentials at the connection points thus read is produced.

3,890,603
ASSOCIATIVE STORE

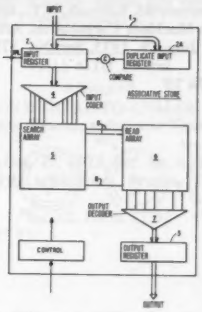
John W. Jones, Winchester; John F. Sears, Eastleigh, and Keith G. Taylor, Chandlers Ford, all of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 26, 1974, Ser. No. 454,982

Int. Cl. G11c *15/00*

U.S. Cl. 340—173 AM **7 Claims**

1. An associative binary store comprising a fixed search field and a fixed read field, each consisting of bistable storage circuits, a binary input register and a binary output register, coding circuitry connected between the input register and the



search field and decoding circuitry connected between the read field and the output register.

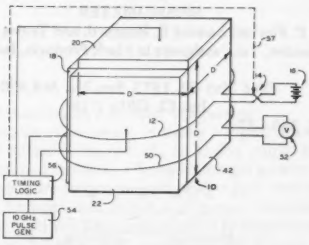
3,890,604
SELECTIVE DIPOLE ORIENTATION OF INDIVIDUAL VOLUME ELEMENTS OF A SOLID BODY

Klaus Schroder, 7226 Coventry Rd., East Syracuse, N.Y. 13057

Filed Nov. 6, 1973, Ser. No. 413,216

Int. Cl. G11c *11/22*

U.S. Cl. 340—173.2 **24 Claims**



1. A system of controlling the physical properties of individual volume elements of a body of solid material by selective orientation of magnetic or ferroelectric dipoles of particles within the body, said system comprising:

a. a solid body having within each volume element thereof a first material characterized by having spontaneously alignable dipoles and a second, non-alignable material, the dipole linkage of individual particles of said first material being such that the dipole orientation within one volume element is insufficient to change the dipole orientation within other volume elements;

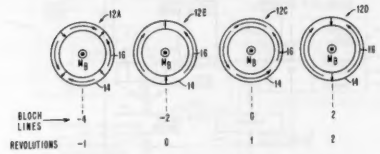
b. means for applying to said body at least one elastic wave, having a predetermined energy density and a pulse width defining the dimensions of said volume element, to travel through said body at a known velocity, thereby producing a maximum energy density in a given volume element of said body at a given time; and

c. means for applying to at least that portion of said body including said given volume element a field of predetermined intensity and orientation, the combined energy levels of said wave and said field being sufficient to change the dipole orientation of said first material within said given volume element, the individual energy levels of said wave and said field being insufficient to change the dipole orientation of said first material.

3,890,605
MAGNETIC DOMAIN SYSTEMS USING DOMAINS HAVING DIFFERENT PROPERTIES

John Casimir Slonczewski, Katonah, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 29, 1973, Ser. No. 375,289
Int. Cl. G11c *11/14*
U.S. Cl. 340—174 TF 32 Claims



1. An information handling apparatus using cylindrical magnetic domains, comprising:

a magnetic medium capable of supporting said cylindrical domains, said domains having domain walls in which wall magnetization exists,

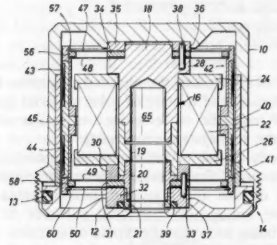
generating means for controllably producing bubble domains having desired amounts of rotation of said wall magnetization around the periphery of said domain walls, said amounts of rotation being indicative of said information,

reading means for determining said amount of rotation of wall magnetization in said domains for detecting said information.

3,890,606
SEISMOMETER

Eugene F. Florian; Samuel E. Haggard, and Travis E. Riley, all of Houston, Tex., assignors to Mark Products, Inc., Houston, Tex.

Filed May 29, 1973, Ser. No. 364,970
Int. Cl. G01v *1/16*
U.S. Cl. 340—17 5 Claims

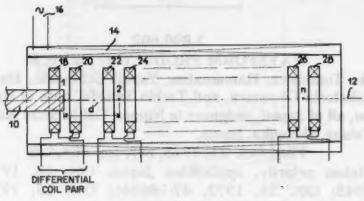


5. A seismometer for sensing motion along a selected axis comprising first and second elements that provide an output signal when moved relative to each other, a spring member connected between the members to support one of said elements relative to the other and to resist the movement of said one element relative to the other along said selected axis with a preselected resilient force to give the seismometer the desired frequency response and two spring members connected between the elements to resist movement of said element relative to the other element laterally of said selected axis while exerting substantially equal and opposite forces resisting such relative movement along said selected axis so as to have a negligible effect on the frequency response of the seismometer along said selected axis.

3,890,607
ELECTROMAGNETIC POSITION INDICATOR

Yves Pelenc, Tronche; Jean Ambier, Grenoble, and Roger Lavergne, Poisat, all of France, assignors to Merlin Gerin, Grenoble, France

Filed Jan. 17, 1973, Ser. No. 324,402
Claims priority, application France, Jan. 24, 1972, 72.02293; Apr. 25, 1972, 72.15576
Int. Cl. G08c *19/08*
U.S. Cl. 340—199 7 Claims



1. An electromagnetic position indicator comprising:

a. inductively coupled primary and secondary winding means extending along a linear path, said secondary winding means comprising a plurality of pairs of series-connected differential coils spaced along said path,

b. an elongated magnetic core having a head end movable along said path, the number of coils linked with said core varying with the position of said core,

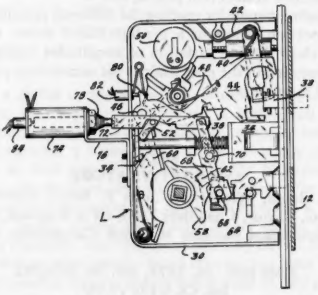
c. means for coupling an alternating current source to said primary winding, the application of said alternating current source to said primary winding subjecting the pairs of differential coils having a coil disposed in the immediate proximity of the head end of said core to magnetic imbalance and producing at the terminals thereof a net non-zero output signal, the remaining pairs of coils being magnetically balanced to produce at the terminals thereof a substantially zero output signal, and

d. circuit means connected to the terminals of all pairs of said coils to deliver a signal representative of the position of said core.

3,890,608
DOOR MONITORING AND CONTROLLING DEVICE FOR A SECURITY SYSTEM

Francis C. Peterson, Affton, Mo., assignor to C. Hager & Sons Hinge Manufacturing Company, St. Louis, Mo.

Filed Oct. 11, 1972, Ser. No. 296,561
Int. Cl. G08b *13/08*
U.S. Cl. 340—274 14 Claims



1. In a security system for monitoring a door in a door frame, and including a strike on the door frame and an alarm,

an improved lock comprising: a retractable latch bolt movable between extended and retracted positions and normally urged to the extended position, the latch bolt when in its extended position being projected beyond the door for engagement with the strike to secure the door in a closed position, the latch bolt when in its retracted position being located beyond the strike so that the door is released from the strike and can be opened, retracting means for moving the latch bolt to its retracted position; a locking element movable between blocking and release positions, the locking element when in its blocking position preventing the latch bolt from moving to the retracted position, the locking element when in its release position permitting the latch bolt to move to its retracted position, the locking element being held in its release position by the latch bolt when the latch bolt is in its retracted position; an auxiliary latch projecting beyond the door when the door is open for engagement with the strike as the door is closed and being depressed by the strike when the door is closed, the auxiliary latch being connected with the locking element for holding the locking element in its release position when the door is open and the auxiliary latch is projected beyond the door, the auxiliary latch when depressed permitting the locking element to move to its blocking position, whereby the locking element will assume its blocking position only when the latch bolt is in its extended position and the auxiliary latch is depressed, and a switch operated directly by the locking element such that the switch condition changes with each movement of the locking element between its release and blocking positions, the switch being electrically connected with the alarm, whereby the switch monitors the position of the locking element.

3,890,609

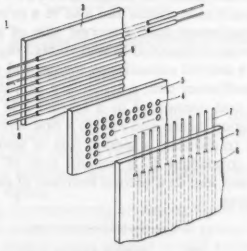
LOW VOLTAGE COLD CATHODE DISCHARGE TYPE DISPLAY DEVICES WITH METAL OXIDE CATHODE AND PHOSPHOR ANODE MATRIX

Rentaro Sasaki; Akinori Watanabe, both of Takasaki; Tatsuo Ogasawara, Tokyo, and Hidetoshi Sogabe, Gyoda, all of Japan, assignors to Oki Electric Industry Co., Ltd. and Okaya Electric Industry Co., Ltd., both of Tokyo, Japan

Filed Apr. 5, 1973, Ser. No. 348,249

Int. Cl. H05b *37/00*

U.S. Cl. 340—324 M **5 Claims**



1. A cold cathode discharge type display device comprising a pair of insulative substrates, at least one of the substrates being transparent, an insulative spacer disposed between said pair of substrates, said spacer being provided with a plurality of perforations which are arranged in a matrix, a plurality of cold cathode electrodes disposed between one substrate and said insulative spacer with each cold cathode electrode opposed to one row of the matrix, an electron emissive metal oxide coated on respective cold cathode electrodes, a plurality of anode electrodes disposed between the other insulative substrate and said insulative spacer with each anode electrode opposed to one column of the matrix, means for hermetically sealing the peripheries of said pair of substrates thereby forming a sealed envelope, an inert gas sealed in said envelope, and means for applying an operating voltage across a selected one of the anode electrodes and a selected one of the cathode electrodes so as to establish electric discharge at the cross-point between said selected anode and cathode electrodes thereby displaying a desired pattern.

3,890,610

HIGH-PRECISION DIGITAL-TO-ANALOG CONVERTERS

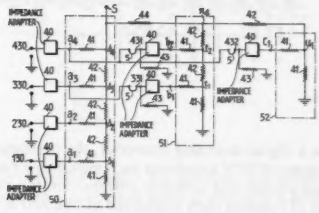
Olivier Cahen, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 29, 1973, Ser. No. 410,410

Claims priority, application France, Oct. 31, 1972, 72.38594

Int. Cl. H03k *13/02*

U.S. Cl. 340—347 CC **10 Claims**



1. A digital-to-analog converter comprising:

a first plurality of terminals including *n* digital input terminals of different binary rank, an analog output terminal and a ground terminal, *n* being an integer greater than 1;

a first resistive ladder network with n first sections connected between said output and ground terminals, said sections including first series resistors of magnitude R and first branch resistors of magnitude **2R** forming n first junctions;

a second resistive ladder network with *j* second sections connected between said output and ground terminals in parallel with said first ladder network, *j* being an integer smaller than *n*, said second sections including second series resistors of magnitude R and second branch resistors of magnitude **2R** forming *j* second junctions;

a resistive connection of magnitude greater than R between said output terminal and said second ladder network;

n first impedance-adapting means with substantially zero output impedance connectng each of said input terminals with a respective first junction, the separation of said first junctions from said output terminal decreasing with increasing ranks of the input terminals connected thereto;

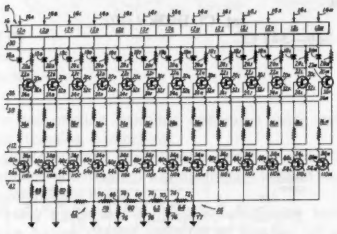
j second impedance-adapting means with substantially zero output impedance connecting the *j* highest-ranking input terminals with a respective second junction; and

rupturable connector means between said *j* highest-ranking input terminals and said second impedance-adapting means enabling calibration of said first ladder network by selective disconnection of any of said second impedance-adapting means from the corresponding input terminals with resulting modification of the output voltage of said first ladder network due to energization of said corresponding input terminals.

3,890,611
CONSTANT-CURRENT DIGITAL-TO-ANALOG CONVERTER

James J. Pastoriza, Lincoln, Mass., assignor to Analog Devices, Incorporated, Norwood, Mass.

Continuation of Ser. No. 220,016, Jan. 24, 1972, which is a division of Ser. No. 809,700, March 24, 1969, abandoned. This application Jan. 25, 1974, Ser. No. 436,522
Int. Cl. H03k *13/04*
U.S. Cl. 340—347 DA 1 Claim

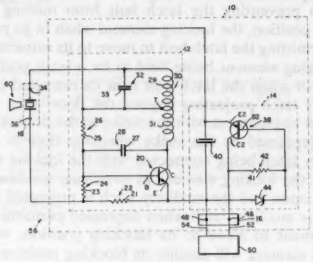


1. In a digital-to-analog converter, the combination of:
a first set of NPN transistors each including a base electrode and emitter and collector current-carrying electrodes;
a set of resistors each connected at one end to the emitter electrode of a corresponding transistor of said first set;
negative power-supply voltage means connected to the other end of each of said set of resistors;
means connected to the base electrodes of said first set of transistors to set the voltage between the bases of said transistors and the other ends of said resistors so as to provide for at least substantially constant current flow through the respective transistor when it is activated for current flow;
output circuit means connected to the collector electrodes of said first set of transistors to conduct currents developed by the activated transistors through an output line;
a second set of transistors each including a base electrode and emitter and collector current-carrying electrodes;
power supply means coupled to the base electrodes of said second set of transistors to control the base potentials thereof;
means connecting one of said current-carrying electrodes of each of said second set of transistors to said one end of a respective one of said resistors to establish paths for current flow serially through each of said second set of transistors and an associated one of said resistors;
positive power supply means connected to the other of said current-carrying electrodes of said second set of transistors to produce said serial flow of current through each transistor and the associated resistor with a predetermined magnitude sufficient to cut off current flow through the corresponding transistor of said first set of transistors which is connected to that resistor, said second set of transistors being arranged as constant-current sources to maintain said serial flow of current at said predetermined magnitude when activated; and
means coupled to each transistor of said second set of transistors to apply thereto logic control voltages for selectively activating the transistors of said second set so as to produce said serial flow of current through the respective transistor of said second set and the corresponding resistor connected thereto, whereby to cut off current flow through the corresponding transistor of said first set of transistors.

3,890,612
HIGH OUTPUT AUDIBLE ALARM DEVICE UTILIZING A PIEZOELECTRIC TRANSDUCER

Louis P. Sweany, Carmel, and James D. Pirtle, Lawrence, both of Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Sept. 28, 1973, Ser. No. 401,944
Int. Cl. G08b *3/10*
U.S. Cl. 340—384 E 6 Claims



1. An audible alarm device comprising:
a. an acoustical loading means;
b. a piezoelectric transducer in spaced relation to said acoustical loading means;
c. a solid-state amplifier drive circuit cooperating with said piezoelectric transducer to produce an audible signal including an activation circuit connected to said piezoelectric transducer, a voltage regulator connected to said activation circuit, and a power supply connection means connected to said voltage regulator, said activation circuit comprising:
a transformer coil to increase voltage from a power supply to said piezoelectric transducer, a first NPN transistor, emitter connected to said voltage regulator and to a first side of a first resistance means, base connected to a first side of a second resistance means, to a first side of a third resistance means and also to a first side of a first capacitance means, collector connected to a second side of said first capacitance means and also to a primary winding of said transformer coil; a second side of said third resistance means connected to said voltage regulator, to a first side of a second capacitance means and also to a tap on said transformer coil; a secondary winding of said transformer coil connected to a second side of said second capacitance means and also to a first terminal of a piezoelectric transducer; a second side of said first resistance means connected to a second side of said resistance means and also to a second terminal of said piezoelectric transducer.

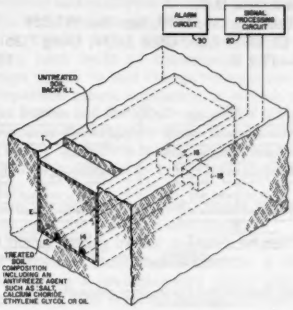
3,890,613
TECHNIQUE FOR MINIMIZING LOSS OF SENSITIVITY OF BURIED PRESSURE RESPONSIVE DEVICES

William K. Dunsworth, Export, and Fred G. Geil, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 18, 1973, Ser. No. 398,350
Int. Cl. F16l *1/00;* E02d *3/14*
U.S. Cl. 340—407 1 Claim

1. A method for minimizing loss of sensitivity of pressure responsive devices buried beneath the surface of the ground due to frozen soil conditions, comprising the steps of, adding an anti-freeze agent to a predetermined volume of previously untreated natural soil between a buried pressure responsive device and the surface of the ground, limiting the soil contacted by said anti-freeze agent to the soil defined within said

predetermined volume, enclosing said pressure responsive device and said predetermined volume of soil within a non-


ALARM CIRCUIT
SIGNAL PROCESSING CIRCUIT
UNTREATED SOIL BACKFILL
TREATED SOIL COMPOSITION INCLUDING AN ANTIFREEZE AGENT SUCH AS SALT, CALCIUM CHORIDE, ETHYLENE GLYCOL OR OIL

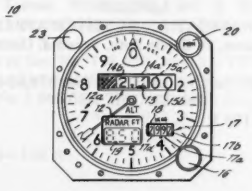
porous enclosure, and covering said enclosure with untreated soil.

3,890,614

INTEGRATED RADAR-PNEUMATIC ALTIMETER DISPLAY DEVICE

Michael Argentieri, West Orange, and Robert Kelso, Bloomfield, both of N.J., assignors to Intercontinental Dynamics Corporation, Englewood, N.J.

Filed Feb. 20, 1973, Ser. No. 333,807
Int. Cl. G01l 7/00; G01s 9/04; G08g 5/00
U.S. Cl. 343—5 DP **3 Claims**



1. A compact instrument for displaying an altitude reading comprising:

a housing having a front face;

said front face having a window;

electronic decimal multi-digit illuminated display means positioned behind said dial face for displaying an illuminated multi-digit altitude reading;

first means for receiving an analog signal representative of an altitude signal;

second means for converting an analog signal into a plurality of binary coded decimal digit signal groups representative of the analog signal applied to said second means;

third means coupled to said second means for coupling said signal groups to associated digit positions of said decimal multi-digit display means to provide an illuminated display of an altitude reading;

an adjustable knob positioned to be accessible at said front face, said knob being linearly movable between first and second positions and being rotatable about a central axis;

fourth means for generating an analog voltage whose magnitude represents the amount of rotation of said knob;

switch means operative under control of said knob for selectively coupling only the output of said first means to said second means when said knob is in said first position and for coupling only the output of said fourth means to said second means when said knob is in said second position;

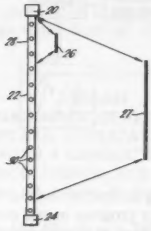
comparison means coupled to said first means and said fourth means for generating an alarm signal whenever said knob is in said first position and the signal level derived from said first means is equal to or less than the signal level derived from said fourth means.

3,890,615

TARGET DETECTION SYSTEM

Michael James Moran, Balerno, Scotland, assignor to Microwave and Electronic Systems Ltd., Newbridge, Scotland

Filed Oct. 30, 1972, Ser. No. 301,921
Claims priority, application United Kingdom, Nov. 2, 1971, 50937/71
Int. Cl. G01s 9/44
U.S. Cl. 343—5 PD **2 Claims**



1. A target detection system for detecting the presence of a moving target in a monitored space comprising a generator of wave energy; a distributed antenna arrangement comprising a radiative transmission line for radiating a proportion of wave energy applied thereto, one end of said transmission line being coupled to said generator for energization thereby to radiate a proportion of the energy supplied to said antenna arrangement, said antenna arrangement being distributed along a path extending through said monitored space and different portions of said antenna arrangement irradiating a portion of said space in the immediate vicinity thereof whereby the radiated energy is distributed through said space at low intensity; and a receiver coupled to another end of said transmission line to receive therefrom signals exhibiting Doppler-shift returned to said antenna arrangement from a moving target irradiated thereby, and receive non radiated energy supplied to said antenna arrangement by said generator and being responsive thereto and to said Doppler-shifted signals to derive a Doppler-shift signal indicative of the presence of a moving target.

3,890,616

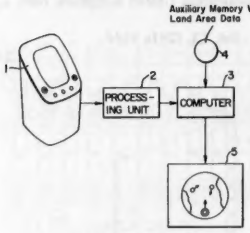
RADAR ANTI-COLLISION SYSTEM FOR SHIPS IN WATERS ADJACENT LAND AREAS

Takeshima Kojima; Masabumi Iizuka, both of Tokyo; Kenta Kabayama, and Shizuhiro Izawa, both of Yokohama, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Sept. 6, 1973, Ser. No. 394,575
Claims priority, application Japan, Dec. 28, 1972, 48-327
Int. Cl. G01s 7/22, 7/24
U.S. Cl. 343—5 MM **4 Claims**

1. A radar anti-collision system, for avoiding collisions between water-borne vessels in waters adjacent land areas, comprising, in combination, a radar mounted on a vessel and scanning objects in the course of the vessel; a data processing unit having an input connected to said radar and processing the positional data of land areas and of other vessels scanned by said radar; a computer connected to the output of said data processing unit; an auxiliary memory connected to an input of said computer and having stored therein a set of marine positional data with respect to land areas adjacent the course of the vessel, said auxiliary memory supplying the stored data to

said computer in accordance with a present program for comparison, in said computer, with the positional data supplied by said data processing unit from said radar; and a general display unit connected to the output of said computer; said computer comparing the stored positional data with the processed positional data and, responsive to such comparison indicating that the vessel is at a greater distance from land areas than limits defined by the stored positional data, cancelling processed



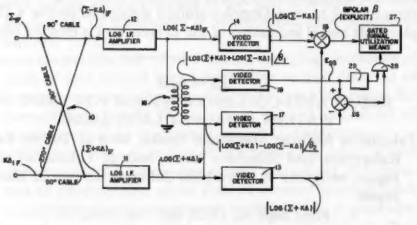
positional data relating to land areas from the positional data to a collision avoidance program in said computer so that the processing by said collision avoidance program becomes more reliable and the data displayed on said general display unit, responsive to such comparison indicating that the vessel is at a greater distance from land areas than limits defined by the stored positional data, does not include any positional data relating to land areas.

3,890,617

LOGARITHMIC MONOPULSE RECEIVER

James A. Moulton, Santa Ana, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 6, 1968, Ser. No. 703,381
Int. Cl.[2] G01S 9/22
U.S. Cl. 343—7 A **6 Claims**



1. A monopulse system including an intermediate frequency stage providing target angle signal performance having reduced anomalies, and comprising a first and second intermediate frequency signalling channels providing a respective first and second signal indicative of the respective logarithmic vector sum and difference of a monopulse sum and difference signal, each said channels comprising

intermediate frequency vector combining means responsive to said monopulse sum and difference signals; and

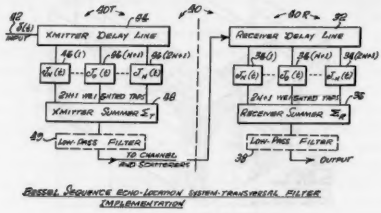
logarithmic signalling means responsive to the output of said vector combining means.

3,890,618

BESSEL SEQUENCE ECHO-LOCATION SYSTEM

Jeffrey M. Speiser, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 30, 1973, Ser. No. 393,259
Int. Cl. G01s 7/28; G06f 15/34; G06g 7/26
U.S. Cl. 343—17.1 R **11 Claims**



BESSEL SEQUENCE ECHO-LOCATION SYSTEM-TRANSMISSAL FILTER IMPLEMENTATION

1. A transmitter for use in an echo-location system for radar or sonar, comprising:

a source of signals comprising a sequence of weighted pulses conforming to the equation

$$\sum_{n=-N}^{N} J_n(x)p(t-nT),$$

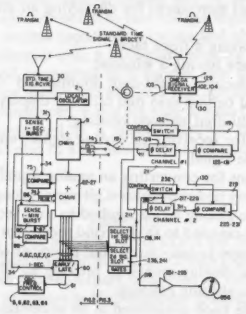
where $J_n(x)$ denotes the nth Bessel function of the first kind, $p(t)$ is the time function corresponding to an elementary pulse, and T is the spacing between elementary pulses.

3,890,619

OMEGA NAVIGATION RECEIVER APPARATUS

George R. Mounce, 18 Bridle Path, Toronto, Ontario, Canada (M2L 1C8)

Filed July 12, 1973, Ser. No. 378,634
Int. Cl. G01s 1/30
U.S. Cl. 343—105 R **15 Claims**



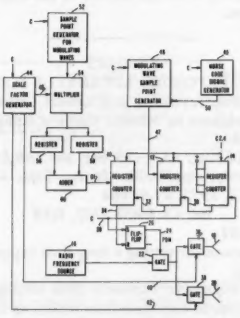
1. Omega Navigation receiver apparatus for determing the phase relationship between multiple Omega signals of the same frequency which are transmitted successively by different Omega transmitters according to a predetermined repeating real-time cycle, and the apparatus using time signals broadcast from a Standard Time Signal station to identify the sources of said Omega signals, by determining their positions in said repeating cycles comprising in the apparatus:

a. a receiver for receiving the Omega signals and a receiver for receiving said Standard Time Signals;
b. a reference oscillator generating an oscillation;
c. frequency divider chains connected to divide the frequency of said oscillation to obtain a reference oscillation of the same frequency as said transmitted Omega signals, and to obtain timing signals representing the moments during each cycle of transmission of said successive Omega signals by said Omega transmitters;
d. comparison means connected to receive said Standard Time Signals and the locally-generated timing signals and to compare their relative times of occurrence and including timing correction means responsive to said relative times of occurrence to bring these signals into coincidence;
e. means for selecting certain Omega signals from their positions in the repeating time cycle;
f. first phase shifting means operative to shift the phase of said reference oscillation to provide a first reference signal having a predetermined phase relationship with respect to a first selected one of said received Omega signals;
g. second phase shifting means operative to shift the phase of a signal based on the first reference signal to provide a second reference signal having said same predetermined phase relationship with respect to a second selected one of said Omega signals; and
h. indicator means responsive to the amount of phase shift performed by said second phase shifting means to indicate the phase difference between the first and second Omega signals.

3,890,620
METHOD AND APPARATUS FOR MODULATION SYNTHESIS

Donald J. Toman, Pleasantville, and J. Roland Coulter, Harrison, both of N.Y., assignors to Tull Aviation Corporation, Armonk, N.Y.

Division of Ser. No. 198,839, Nov. 15, 1971, Pat. No. 3,793,597, which is a division of Ser. No. 196,288, Nov. 8, 1971, Pat. No. 3,808,558. This application Jan. 14, 1974, Ser. No. 430,272
Int. Cl. G01s *1/16*
U.S. Cl. 343—108 R **7 Claims**

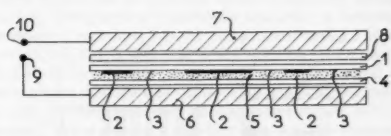


1. Apparatus for synthesizing the production of a modulated radio carrier wave comprising
storage means for continuously storing the same group of digital values corresponding to a plurality of different sample points signifying various modulation levels required at successive points in time to suggest the presence of a modulation signal wave form,
means for reading out said sample point values in timed sequence,
a source of carrier waves,
means for transferring and means for applying said point values to modify the carrier waves to produce a modified carrier which is recognizable by a receiver as a carrier modulated by a repetitive wave form modulation signal, said means for applying said point values to modify the carrier wave comprising a gating device operable to gate the carrier on and off for periods proportional to the sample point values to thereby establish a pulse duration modulated carrier signal,
a plurality of antenna elements arranged in an array,
and switching means operable in synchronism with said gating device to switch the carrier to different antenna elements in said array for the successive individual periods when the carrier is on to thereby provide a composite scanning beam signal from all of the elements of said array.

3,890,621
ELECTROGRAPHIC DEVICES FOR THE NON-ELECTROSTATIC DUPLICATION OF ORIGINALS PROVIDED WITH A CONDUCTIVITY PATTERN FORMED FROM INDICIA AND BLANK AREAS

Marcus Cantarano, 47, avenue F. Roosevelt, 94320 Thiais, France

Division of Ser. No. 151,489, June 9, 1971, Pat. No. 3,849,126, which is a continuation-in-part of Ser. No. 631,792, April 18, 1967, abandoned. This application Jan. 7, 1974, Ser. No. 431,961
Int. Cl. G01d *15/06*
U.S. Cl. 346—74 ES **10 Claims**



1. An electrographic device comprising an original provided with a conductivity pattern ranging from a portion formed from a first material having a greater electric conductivity to a portion formed from a second material having a lesser conductivity, means for placing a thin layer of electrically chargeable particles in contact with said conductivity pattern, means for generating an alternatively modulated electric field of sufficient strength across said conductivity pattern and said layer of electrically chargeable particles so as to transfer electric charges from said conductivity pattern to said electrically chargeable particles whereby a portion of said particles is sufficiently charged and removed from said layer of electrically chargeable particles and the remainder of said particles is insufficiently charged so that it remains in said particles layer thereby forming a stable electrographic image.

3,890,622
SEALED CASSETTE FOR MOIST FACSIMILE RECORDING PAPER

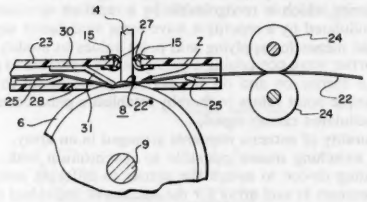
John M. Alden, Needham, Mass., assignor to Alden Research Foundation, Westboro, Mass.

Filed July 9, 1973, Ser. No. 377,261
Int. Cl. G01d *5/06*, *15/28*
U.S. Cl. 346—74 E **4 Claims**

1. An electric graphic recording cassette detachably fitting a recorder having a scanning electrode cooperating with a linear electrode in a recording zone, the cassette comprising: a housing including a moist recording web supply compartment and guide means forming an exit path for the web

through the recording zone, the housing having an opening at the recording zone admitting the scanning electrode thereto, and the guide means including means urging the web toward the opening and into the recording zone, and

a resilient member extending along the recording zone and having a free flexing end closely adjacent the zone and



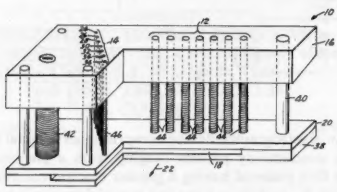
biased yieldingly to displace the web out of the recording zone away from the linear electrode, the scanning electrode resiliently urging the web into contact with the linear electrode against the yielding displacement of the resilient member only at the effective recording spot where the scanning electrode opposes the linear electrode.

3,890,623

MAGNETIC DOCUMENT ENCODER HAVING MULTIPLE STAGGERED STYLI

Ronald F. Schmid, White Beak Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St Paul, Minn.

Filed May 2, 1973, Ser. No. 356,320
Int. Cl. G01d *15/12*
U.S. Cl. 346—74.1 **18 Claims**



1. An apparatus for subjecting a medium to time-spaced localized intense magnetic fields outlining alphameric characters, which apparatus comprises:

means for transporting and positioning a medium along a transport path;

a plurality of electromagnetic styli positioned in a staggered array across said transport path such that at least two of said styli are differently spaced from a reference line normal to said transport path, each of said styli comprising a substantially cylindrical body having a high permeability, high magnetic moment, and low magnetic remanence, which body terminates at one end as a shaped pole face positioned along the transport path to concentrate the flux through said medium and terminates at the opposite end in a flux return member extending around and under said transport path and further comprising a coil surrounding said body closely positioned adjacent said pole face to maximize the flux produced in the pole face in said medium, said coil containing not more than 500 turns; and

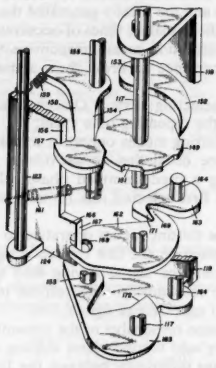
means for selectively energizing said styli in synchronization with the movement of the medium to form a plurality of localized magnetic fields outlining an alphameric character.

3,890,624

TIME RECORDER

Rudolph B. Danke, Petersham, Mass., assignor to Simplex Time Recorder Company, Gardner, Mass.

Division of Ser. No. 236,358, March 20, 1972, Pat. No. 3,800,301. This application Jan. 24, 1974, Ser. No. 436,148
Int. Cl. G07c *1/06*
U.S. Cl. 346—91 **8 Claims**



1. A time recorder comprising

a. a housing,

b. a time stamp shaft mounted in the housing,

c. a plurality of time wheels mounted on the shaft,

d. an electric motor mounted on the frame,

e. a pawl mechanism driven by the motor and operative through pawls engaging ratchet wheels to index the wheels,

f. a locking pawl engaging a ratchet on each wheel,

g. a locking bar engaging a surface on each locking pawl to prevent movement of the wheels except when a pawl engages a ratchet for incremental motion, and

h. a release element mounted on the shaft and engageable with the locking bar, the release element being rotated about the shaft with the pawl mechanism and having a notch that envelopes an edge of the locking bar and carries it away from the surface of the locking pawl during rotation.

3,890,625

LONG-TIME EXPOSURE APPARATUS FOR CAMERA

Kuramoto Yoshio, Toyonaka, and Kobori Toshio, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

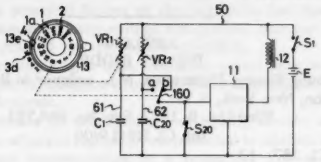
Filed Aug. 23, 1973, Ser. No. 390,818
Claims priority, application Japan, Sept. 12, 1972, 47-92153; Sept. 12, 1972, 47-92154
Int. Cl. G03b *7/02, 9/58*
U.S. Cl. 354—51 **16 Claims**

11. An apparatus for setting a long-time exposure in a camera comprising:

a manually adjustable exposure time setting member for setting a desired exposure time within an ordinary exposure time,

a manually adjustable long-time exposure setting member for setting an exposure time longer than any exposure time to be set by the exposure time setting member, and a delay circuit included in an exposure time control electric circuit for determining an exposure time in accordance with its time constant, the delay circuit including an exposure time control element for adjusting the time

constant and capacitor means having a first capacitor for an ordinary time exposure and a second capacitor for a long-time exposure, the value of the exposure time control element being settable by the exposure time setting member and the long-time exposure setting member so as to adjust the time constant, and the capacitors and the exposure time control element being so arranged that the second capacitor is connected into the delay circuit so as



to increase the capacitance of the capacitor means and that the value of the exposure time control element set by the long-time exposure setting member is made effective when the exposure time setting member is set in a specified position, whereby the time constant is determined by the increased capacitance of the capacitor means and the value of the exposure control element set by the long-time exposure setting member with the exposure time setting member set in the specified position.

3,890,626

ADJUSTING MEANS FOR CAMERAS HAVING SEVERAL LENSES

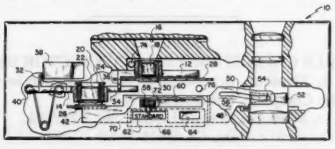
Helmut Ettischer, Stuttgart, Germany, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 10, 1974, Ser. No. 477,579

Claims priority, application Germany, June 14, 1973, 2330264

Int. Cl. G03b *3/00*

U.S. Cl. 354—197 **3 Claims**



1. In a camera having an optical axis; a plurality of lenses, each lens being selectively movable between a stored position out of alignment with the optical axis and a taking position in alignment with the optical axis, at least one of said lenses being focusable while in said taking position; and a movable actuating member operatively connected to said lenses for moving one lens to its taking position while moving another lens to its stored position; the improvement comprising means interconnecting said actuating member and said focusable lens for adjusting the focus setting of said focusable lens upon movement of said actuating member.

3,890,627

CAMERA CONTROLS FOR BLOCKING LIGHT ENTERING THROUGH A VIEWFINDER OCULAR

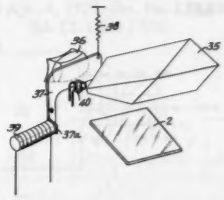
Naoyuki Uno, Kawagoe, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Filed Sept. 19, 1973, Ser. No. 398,811

Claims priority, application Japan, Sept. 21, 1972, 47-109950

Int. Cl. G03b *13/00*

U.S. Cl. 354—224 **12 Claims**



1. In a single lens reflex camera, mirror means movable between a lower viewing position and an upper exposure position, viewfinder means situated over said mirror means for receiving light reflected therefrom when said mirror means is in said lower viewing position thereof, said viewfinder means including a rear ocular for the camera operator and a prism in front of said ocular and over said mirror means for directing light from said mirror means to said ocular, said viewfinder means having behind said prism a free space through which light travels from said prism to said ocular, photosensitive means situated in said free space to receive light from said prism when said miror means is in said lower viewing position thereof to provide an electrical quantity, memory means for retaining said electrical quantity for utilization in determining the extent of exposure, light-blocking means having a blocking position situated in said free space between said ocular and photosensitive means to prevent light which enters said viewfinder means through said ocular from reaching said prism to be reflected thereby to said photosensitive means, said light-blocking means having a non-blocking position situated beyond the path of light travel from said prism to said ocular, electrical, automatically operable moving means operatively connected with said light-blocking means for automatically moving the latter from said non-blocking to said blocking position thereof, blocking switch means electrically connected with said electrical moving means for automatically actuating the latter, memory switch means having a normal position preventing operation of the memory means and an operating position rendering said memory means operative, shutter-tripping means for tripping a shutter of the camera to initiate an exposure, manually operable release means having a normal holding position and being movable by the operator from said holding position to a release position, and motion-transmitting means held by said manually operable release means in a predetermined starting position when said manually operable release means is in said holding position thereof, said motion-transmitting means being released for movement from said starting position thereof when said manually operable release means is displaced by the operator to said release position thereof, said motion-transmitting means being operatively connected with said blocking switch means, said memory switch means, said mirror means, and said shutter-tripping means for operating all of the latter means in a sequence according to which said blocking switch means is first actuated for first operating said moving means automatically to move said light-blocking means to said blocking position thereof, said memory switch means is then operated to be displaced from said normal to said operating position thereof, said mirror means is then at least started by said motion-transmitting means to move from said lower viewing position to said upper exposure position thereof, and said shutter-

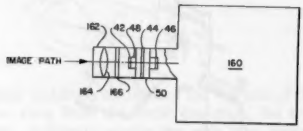
tripping means is then actuated by said motion-transmitting means to open the camera shutter.

3,890,628

LIQUID CRYSTAL LIGHT CONTROL DEVICE AND CIRCUIT

Richard W. Gurtler, Mesa, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Oct. 23, 1973, Ser. No. 408,779
Int. Cl. G03b 9/56
U.S. Cl. 354—227 **5 Claims**



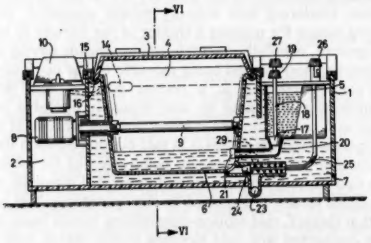
1. A camera including in combination:
lens means located in an image path suitable for transmitting an image to be photographed; and
normally closed liquid crystal shutter means located in the image path and arranged to receive the image transmitted by said lens means, said liquid crystal shutter means including first and second liquid crystal cells and means for supplying operating potentials to said liquid crystal cells, the application of operating potential to the first of said cells causing molecules of liquid crystal material in said first cell to align and thereby to pass light through said shutter means, the subsequent application of operating potential to said second cell causing molecules of liquid crystal material in said second cell to align and thereby to block passage of light through said shutter means.

3,890,629

DEVICE FOR DEVELOPING PHOTOGRAPHIC FILM OR PAPER

Heinrich Huss, Liebifstrasse 1, 6051 Weiskirchen, Germany

Continuation of Ser. No. 239,180, March 29, 1972, abandoned. This application Aug. 16, 1973, Ser. No. 388,889
Claims priority, application Germany, Mar. 31, 1971, 2115487; Mar. 31, 1971, 7112239
Int. Cl. G03d 13/00
U.S. Cl. 354—299 **6 Claims**



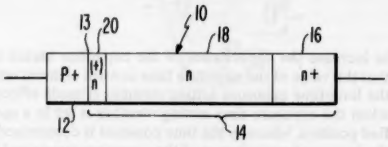
1. A device for developing photographic material comprising:
a housing forming an elongated tank providing a light-impermeable developing chamber therein;
a drum in said tank rotatable about a horizontal axis for immersing photographic material therein;
a plurality of reservoirs for chemicals for use in a photographic process disposed in said housing adjacent said tank;
conduit means providing fluid communication between the tank and said reservoirs;
a water jacket enclosing said tank, said conduit means and said reservoirs for heat exchange through said tank and said reservoirs between chemicals therein and water of said jacket;
a temperature-control device for maintaining the temperature of said water jacket constant, the floor of said tank being arcuate and provided with a pair of spaced apart longitudinal beads; and
a barrier wall disposed in and transversely of the tank with opposite corners of the barrier wall tucked clampingly under said beads.

3,890,630

IMPATT DIODE

Ho-Chung Huang, Hightstown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 9, 1973, Ser. No. 404,793
Int. Cl. H01l 9/00
U.S. Cl. 357—13 **4 Claims**



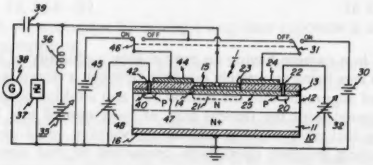
1. A semiconductor diode comprising a body of single crystalline semiconductor material having a region of P-type conductivity and a region of an N-type conductivity, with a PN junction therebetween, said N-type region being divided into first, second and third subregions of which the second subregion is a center subregion doped to have a carrier concentration, n_2, substantially exceeding intrinsic carrier concentration, and the subregion contiguous to said PN junction is said first subregion doped to have a predetermined carrier concentration, n_1, greater than said center subregion carrier concentration, said third subregion being doped to have a carrier concentration substantially greater than said center subregion, said center subregion having a thickness, l_2, and said subregion contiguous to said PN junction having a thickness, l_1, less than said thickness, l_2, so that diode punch-through voltage to said third subregion substantially equals diode breakdown voltage at a desired diode operating frequency.

3,890,631

VARIABLE CAPACITANCE SEMICONDUCTOR DEVICES

Jerome J. Tiemann, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,394
Int. Cl. H01l 17/00
U.S. Cl. 357—14 **11 Claims**



1. Semiconductor apparatus for providing a capacitance for a high frequency signal variable in discrete increments comprising

a substrate of semiconductor material of one type conductivity including a plurality of spaced surface adjacent regions,

a plurality of capacitance providing electrodes, each insulatingly overlying and spaced a predetermined distance from a respective surface adjacent region of said substrate and forming with respect to a common electrode connected to said substrate a respective capacitor, said capacitance providing electrodes being connected together to provide a common capacitance providing electrode of said apparatus,

means for applying a depletion producing voltage between said common capacitance providing electrode and said common electrode corresponding to a predetermined surface potential having an absolute value less than said depletion producing voltage but greater than the inversion threshold voltage of said apparatus,

means for applying a high frequency signal between said common capacitance providing electrode and said common electrode,

control means for establishing individually in each of said surface adjacent regions a first potential in relation to said substrate corresponding to a respective low value of capacitance between a respective capacitance providing electrode and said common electrode, and for establishing alternatively and individually in each of said surface adjacent regions a second potential in relation to said substrate corresponding to a respective high value of capacitance between a respective capacitance providing electrode and said common electrode,

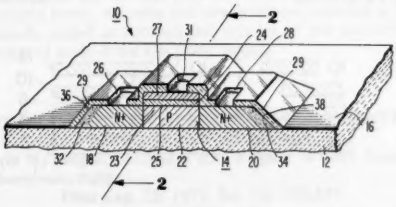
whereby the capacitance of said device is variable in increments dependent on the particular potentials established in the surface adjacent regions of the capacitors from a minimum value corresponding to the sum of the low value capacitances of the capacitors when said first potential is established in all of the surface adjacent regions of said capacitors to a maximum value corresponding to the sum of the high value capacitances of the capacitors when said second potential is established in all of said surface adjacent regions of said capacitors.

3,890,632

STABILIZED SEMICONDUCTOR DEVICES AND METHOD OF MAKING SAME

William Edward Ham, Monmouth Junction, and Doris Winifred Flatley, North Brunswick, both of N.J., assignors to RCA Corp., New York, N.Y.

Filed Dec. 3, 1973, Ser. No. 420,783
Int. Cl. H01l *11/00*
U.S. Cl. 357—23 **5 Claims**



1. A semiconductor device comprising:

a substrate of electrically insulating material,

a mesa of single crystal semiconductor material on said substrate,

said mesa having side surfaces extending transversely from said substrate,

means defining a field effect transistor having source and drain regions and a channel region, said channel region extending between said source and drain regions and between two of said side surfaces, and

doped edge regions, in said channel region adjacent said two side surfaces of said channel region, having more conductivity modifiers than in the remainder of said channel region,

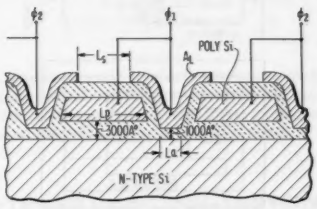
said conductivity modifiers being of the same conductivity type as that of said channel region.

3,890,633

CHARGE-COUPLED CIRCUITS

Walter Frank Kosonocky, Skillman, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 6, 1971, Ser. No. 131,679
Int. Cl. H01l *17/00*
U.S. Cl. 357—24 **10 Claims**



5. In a two-phase operated, charge-coupled circuit, in combination:

a substrate formed of semiconductor material at which charges may be stored;

a plurality of electrode means adjacent to one another forming a row along which charges are to propagate, each such means comprising a pair of electrodes, one electrode formed of a semiconductor and spaced at least twice as far from the substrate as the other electrode of said pair, said other electrode comprising a metal which is spaced of the order of 1,000 A or less from the substrate and which overlaps the semiconductor electrode of the same pair and the semiconductor electrode of the next adjacent electrode means, said semiconductor electrode having a substantially larger area facing the substrate than the portion of the metal electrode closest to the substrate, each semiconductor electrode being directly connected to its paired metal electrode; and

means for applying one phase of a two-phase shift voltage to alternate electrode means and the second phase of the two-phase shift voltage to the other electrode means.

3,890,634

TRANSISTOR CIRCUIT

Heinz Walter Ruegg, Hausena, Switzerland, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 189,086, Oct. 14, 1971, abandoned. This application Nov. 21, 1973, Ser. No. 418,210
Claims priority, application Netherlands, Oct. 23, 1970, 7015520
Int. Cl. H01l *19/00*
U.S. Cl. 357—40 **5 Claims**

1. A solid state device comprising:

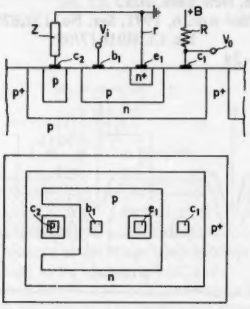
a first region of semiconductor material of one semiconductor type;

second and third regions of semiconductor material of the opposite semiconductor type forming mutually isolated islands within said first region, said second region being closely spaced from only a portion of the surface area of said third region by a portion of said first region, said portion of said first region having a width less than the diffusion length of minority carriers in said first region, whereby said portion of said first region acts substantially as the base region of a lateral transistor, said second and

third regions respectively acting as the collector and emitter thereof;

a fourth region of semiconductor material of said one semiconductor type forming an isolated island within said third region, whereby said fourth region acts as the emitter region of a transversal transistor, said third and first regions respectively acting as the base and collector thereof;

a further transistor having a base of semiconductor material of said opposite semiconductor type and an emitter and



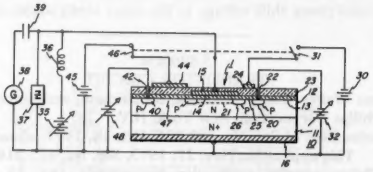
collector of semiconductor material of said one semiconductor type, said base, emitter and collector being electrically connected to said second, fourth and third regions respectively, whereby said lateral transistor is conductive only when said transversal transistor is actually saturated and thereby causes said further transistor to limit saturation of said transversal transistor in response thereto; and means for making electrical connection to said third and fourth regions and to said first region at a location remote from said portion thereof spacing said second and third regions.

3,890,635

VARIABLE CAPACITANCE SEMICONDUCTOR DEVICES

William E. Engeler, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,418
Int. Cl. H01l *17/00*
U.S. Cl. 357—14 **18 Claims**



1. Semiconductor apparatus for providing a capacitance for a high frequency signal variable in discrete increments comprising

a substrate of semiconductor material of one type conductivity,

a plurality of capacitance providing electrodes, each insulatingly overlying and spaced a predetermined distance from a respective surface adjacent region of said substrate and forming with respect to a common electrode connected to said substrate a respective capacitor, said capacitance providing electrodes being connected together to provide a common capacitance providing electrode of said apparatus,

means for applying a depletion producing voltage between said common capacitance providing electrode and said common electrode corresponding to a predetermined surface potential of said surface adjacent regions, said predetermined surface potential having an absolute value less than the absolute value of said depletion producing voltage and greater than the inversion threshold surface potential of said capacitors,

means for applying a high frequency signal between said common capacitance providing electrode and said common electrode,

control means for establishing individually in each of said surface adjacent regions a first potential in relation to said substrate corresponding to a respective low value of capacitance between a respective capacitance providing electrode and said common electrode, and for establishing alternatively and individually in each of said surface adjacent regions a second potential in relation to said substrate corresponding to a respective high value of capacitance between a respective capacitance providing electrode and said common electrode,

said control means including a first control electrode, channel establishing means for individually establishing a plurality of first channel regions of opposite type conductivity in said substrate, each first channel region connected between a respective surface adjacent region and said first control electrode, and means for applying a first control potential to said first control electrode greater in magnitude than said predetermined surface potential whereby each surface adjacent region is drained of charge carries therein when a respective first channel is established,

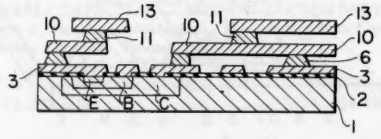
whereby the capacitance of said device is variable in increments dependent on the particular potentials established in the surface adjacent regions of the capacitors from a minimum value corresponding to the sum of the low value capacitances of the capacitors when said first potential is established in all of the surface adjacent regions of said capacitors to a maximum value corresponding to the sum of the high value capacitances of the capacitors when said second potential is established in all of said surface adjacent regions of said capacitors.

3,890,636

MULTILAYER WIRING STRUCTURE OF INTEGRATED CIRCUIT AND METHOD OF PRODUCING THE SAME

Seiki Harada, Hachioji; Atsushi Saiki, Tokyo; Takahiro Okabe, Hachioji, and Kikuji Sato, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 11, 1972, Ser. No. 287,637
Claims priority, application Japan, Sept. 9, 1971, 46-69216
Int. Cl. H01l *5/00*
U.S. Cl. 357—68 **25 Claims**



1. A multilayer wiring structure comprising:

a semiconductor substrate;

a first conductive layer formed with a first prescribed pattern over a major surface of said substrate, said layer including at least one vertically extending land portion;

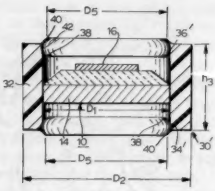
a second conductive layer, formed with a second prescribed pattern in contact with only at least one selected vertically extending land portion at a position above said substrate; and

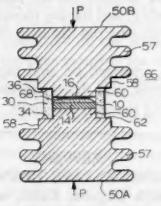
air spaces disposed between said conductive layers above said substrate.

3,890,637
SEMICONDUCTOR ELEMENT ENVELOPE

Isamu Yamamoto, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 17, 1974, Ser. No. 434,117
Claims priority, application Japan, Jan. 25, 1973, 48-11315
Int. Cl. H01l *3/00, 5/00*
U.S. Cl. 357—74 **10 Claims**





1. A semiconductor device comprising, in combination, an annular member of elastic, electrically insulating material including a main portion in the form of a hollow cylinder and an annular engaging portion disposed at least at one end of said main cylindrical portion, said engaging portion including at least one annular fin integrally formed with said main portion; a semiconductor element including a wafer of semiconductive material having at least one P-N junction disposed therein and contacting the inner peripheral surface of said annular member; and a pair of electrode blocks forming an envelope for the semiconductor element with said annular member, each of said electrode blocks including a surface portion, each of said electrode blocks being disposed in contact with said semiconductor element while said surface portion of said electrode block is in engagement with said engaging portions on said annular member so that said annular fin is spread out on said surface portion of the associated electrode block, whereby the semiconductor element is hermetically sealed up between said annular fin and said surface portion of each of the electrode blocks.

3,890,638
COLOR PHASE MATCHING SYSTEM FOR MAGNETIC VIDEO TAPE RECORDINGS

David W. Bargen, San Jose, Calif., assignor to CMX Systems, Sunnyvale, Calif.

Filed Aug. 22, 1973, Ser. No. 390,577
Int. Cl. H04n *9/02*
U.S. Cl. 358—8 **16 Claims**

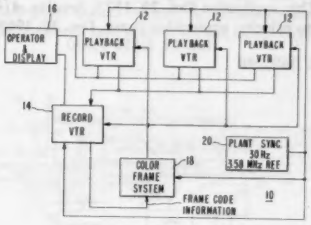
1. A color frame system for use with a video tape recorder/reproducer for providing proper color burst phase matching comprising:

a. means for identifying alternate frames of video recorded on the recording tape;

b. means for detecting the alternate-frame identifications to generate alternate-frame identification signals to distinguish alternate frames recorded on the tape;

c. means synchronized with a stable signal source for generating frame reference signals at a frequency to provide means for distinguishing alternate video frames in time relative to said stable signal source;

d. means for comparing said alternate-frame identification signals and said frame reference signals; and

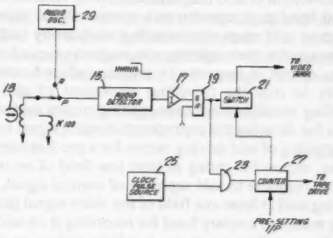


e. means responive to said comparison means to control the tape speed and/or position for correcting the recording tape frame position relative to said frame reference signal if required for proper color burst phase match.

3,890,639
VIDEO TAPE RECORDING ANIMATION SYSTEM

Leopold Henry O'Donnell, Montreal; Robert Forget, St. Vincent de Paul, and Youssef Hasrouni, Montreal, Canada, assignors to Her Majesty the Queen in right of Canada as represented by the Secretary of State, Ottawa, Canada

Filed June 8, 1973, Ser. No. 368,300
Int. Cl. G11b *27/08, 15/00;* **H04n** *5/78*
U.S. Cl. 360—14 **8 Claims**



1. A method for controlling a video tape recorder in such a way that a selected number of frames of video information can be recorded, by video recorder means, on a video tape in said video tape recorder from a first position on the video tape on command;

said video tape comprising an audio frequency portion and a video frequency portion;

said method comprising:

positioning said video tape so that a second position on said video tape, predetermined length behind said first position, is adjacent said video recording means;

impressing an audio signal on said audio frequency portion of said video tape along the predetermined length of said video tape;

moving said video tape in its forward recording direction;

detecting the audio signal on the audio portion of said video tape while the tape is moving in its forward direction;

turning on the video recording means after the cessation of the audio signal and starting a count of frames elapsed after the turn on of the video recording means;

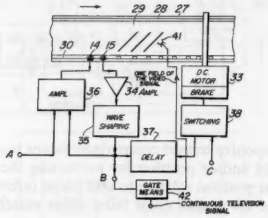
detecting a count corresponding to the selected number of frames; and

turning off said video recording means when the count is detected.

3,890,640
STEP DRIVEN MAGNETIC RECORDING AND REPRODUCING APPARATUS

Toshiomi Yabu, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 102,022, Dec. 28, 1970, abandoned. This application Oct. 29, 1973, Ser. No. 410,563
Claims priority, application Japan, Dec. 30, 1969, 45-1715
Int. Cl. G11b 15/00
U.S. Cl. 360—50 2 Claims



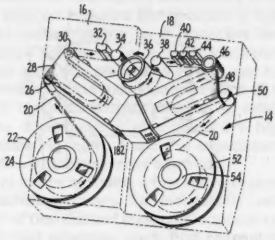
1. A magnetic recording and reproducing apparatus for the recording of information during incremental non-continuous motion of a magnetic recording medium, comprising a first head gap disposed at a fixed position relative to said magnetic recording medium, a second head gap disposed at a fixed position along the track of and spaced from said first head gap in the travelling direction of said magnetic recording medium, means for driving said magnetic recording medium, means for energizing said magnetic recording medium driving means in response to the application of a start signal to cause the travelling movement of said magnetic recording medium so that said second head gap reproduces a control signal previously recorded on said magnetic recording medium by said first head gap, means for deenergizing said magnetic recording medium driving means in response to said reproduced control signal thereby to stop the travelling movement of said magnetic recording medium, said deenergizing means including delay means for delaying the reproduced control signal to delay the deenergizing of said driving means for a predetermined period of time, means for gating at least one field of an input video signal in response to said reproduced control signal, means for applying said at least one field of the video signal gated by said gating means to a rotary head for recording it on said magnetic recording medium on a track which makes an angle with respect to the travelling direction of said magnetic recording medium, and means for applying the reproduced control signal to said first head gap to record a succeeding control signal on said magnetic recording medium at the same time that said at least one field of the video input signal is applied to said rotary head.

3,890,641
HELICAL SCAN MAGNETIC TAPE TRANSPORT SYSTEM INCLUDING VACUUM COLUMN TENSION CONTROL AND HELICAL SCANNER AIR BEARING

Frank S. C. Mo, Cupertino, and Vernon R. Natwick, Woodside, both of Calif., assignors to International Video Corporation, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 285,923, Sept. 1, 1972, abandoned. This application Apr. 25, 1973, Ser. No. 354,227
Int. Cl. G11b 15/43, 15/60, 5/52
U.S. Cl. 360—71 5 Claims

1. A tape transport system for transporting magnetic tape on a predetermined tape path comprising in combination:
- a supply means for continuously supplying magnetic tape at the beginning of the tape path;
- a take-up means for continuously storing magnetic tape at the end of the tape path;
- a plurality of air bearing guide means for low friction guiding of the tape on the tape path;
- a helical scanner assembly arranged on said tape path;
- a first vacuum column and a second vacuum column arranged on the tape path on either side of said helical scanner assembly between said supply means and said take-up means having air control means for variably

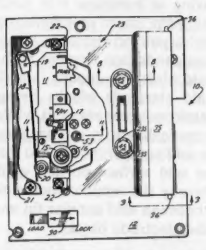


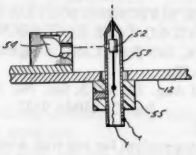
controlling the tension of the tape across said helical scanner assembly, and having monitoring means for continuously monitoring the distance of the tape loop in said columns; and
- a drive capstan arranged on said tape path between said vacuum columns, said drive capstan having drive means for transporting tape on said path.

3,890,642
MAGNETIC TAPE TRANSPORT

John D. Platt, South Laguna, Calif., assignor to MSI Data Corporation, Costa Mesa, Calif.

Division of Ser. No. 104,351, Jan. 6, 1971, Pat. No. 3,731,042. This application May 2, 1973, Ser. No. 356,373
Int. Cl. G11b 15/00
U.S. Cl. 360—96 2 Claims





1. A tape transport assembly for a cassette tape cartridge comprising
- a base member including a pair of reel drive shafts for coupling to the reels of a cassette mounted thereon, said drive shafts each having portions for positively engaging the reels in a driving relationship when correctly coupled thereto and means operative upon rotation of the drive

shafts for causing the correct and positive coupling of the reels and shafts to be effected,

means mounted on the base member for releasably mounting a cassette tape cartridge having a pair of rotatable reels each mounting a plurality of spaced-apart reel driving elements for engaging the drive shafts and with tape extending between the reels and coupled to said reel drive shafts,

a rotatable capstan mounted on the base member and extending therefrom so as to engage one side of the tape,

means coupled to the capstan for rotatably driving same mounted on the opposite side of the base from the cassette mounting means,

a head plate mounted on one side of the base member adjacent to the capstan and to allow movement toward and away from the capstan, said head plate mounting at least a single transducer and a pinch roller in spaced apart relationship to allow the pinch roller to rotatably engage the capstan with the tape therebetween,

a radius arm pivotably mounted to the opposite side of the base member from the head plate and pivotably mounting the head plate, the head plate being pivotable with respect to the radius arm and movable therewith to allow the tape to be advanced from one reel to the other when the plate is swung towards the capstan and allowing the transducer to be operative on the advancing tape,

means mounted on the base member for resiliently positioning the head plate relative to the base member and for urging it towards the cassette mounting means,

control means mounted on the base member for moving the head plate toward the cassette to operatively position the transducer and pinch roller with respect to the tape and capstan, respectively, to allow a transducing operation on the tape; and for moving the head plate away from the pinch roller to allow the mounting and demounting of the tape cartridge on the base member;

said control means including automatic means for moving the radius arm to pivot the transducer and pinch roller on the head plate away from the tape and capstan respectively to a spaced position sufficient to allow the tape of the tape cartridge to be transferred from one reel to the other reel of the tape cartridge, and means for detecting a preselected segment of the tape cartridge and signalling the detection of same, the preselected segment consisting of a light transmitting section and said detection means comprising a light emitting diode mounted on the base member adjacent the head plate for sensing the tape leader and an photoelectric sensor mounted opposite the diode for receiving the light from the diode through the light transmitting section for providing an output signal from the sensor representative of the detection of the light transmitting section of the tape, and the means for mounting the light emitting diode functions as a positioning member for locating the cassette tape cartridge on the base member.

3,890,643

FLEXIBLE DISK DRIVE CARTRIDGE LOADING APPARATUS

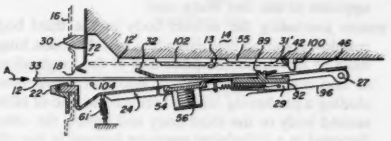
Warren L. Dalziel, Monte Sereno, Calif., assignor to Shugart Associates, Sunnyvale, Calif.

Filed July 12, 1973, Ser. No. 378,549
Int. Cl. G11b *17/04, 5/82*
U.S. Cl. 360—99 **20 Claims**

1. In a flexible disk drive apparatus including a chassis, a disk drive means affixed to the chassis, record/playback means and means for positioning a flexible disk cartridge relative to the drive and record/playback means, an improved cartridge positioning means, comprising:

guide means having a first side pivotally affixed to said chassis and having means for receiving a cartridge inserted on a second side opposite said first side, said guide means being rotatable between a cartridge receiving position and a cartridge loaded position wherein a cartridge disposed in said guide means is moved into engagement with said drive means when said guide means is rotated from said receiving position to said loaded position;

ejector means carried by said guide means and movable along said guide means between a released position and a cocked position, said ejector means being engaged by



said cartridge and moved thereby into said cocked position as said cartridge is received by said guide means and being released to eject said cartridge from said guide means as said guide means is rotated from said loaded position to said receiving position; and

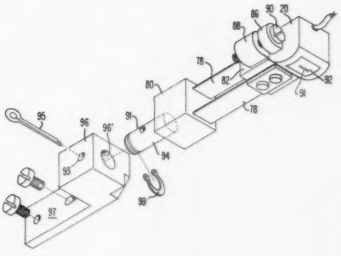
cartridge registering means affixed to said chassis for engaging an edge of said cartridge as said guide means is rotated into said loaded position, and for moving said cartridge into registration with said drive means.

3,890,644

HEAD MOUNTING ASSEMBLY FOR READING AND WRITING ON BANK PASSBOOKS AND THE LIKE

Gunther R. Goetzinger, Detroit, and Hilliard R. Di Veto, Plymouth, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Oct. 29, 1973, Ser. No. 410,709
Int. Cl. G11b *21/02, 21/24, 21/18*
U.S. Cl. 360—101 **23 Claims**



23. A magnetic transducing head assembly comprising, in combination:

a first body containing a transducing head for performing magnetic transductions on a magnetizable surface as said first body is translatably moved along the longitudinal axis thereof;

a second body spaced from the first body;

at least one flexure member bridging the distance between the first and second bodies and having its opposite end secured to said bodies to form a flexible connection therebetween which enables the first body to be deflected relative to the second body toward and into engagement with said magnetizable surface;

means for deflecting the first body such that said transducing head is moved into engagement with said magnetizable surface;

a third body positioned on the side of the second body opposite to the first body; and

means journaling the second body to the third body for rotation about an axis extending in a direction longitudinally of the flexure member and of the longitudinal axis of said magnetizable surface, said journaling means including a pin having one end secured to one of either the second body or the third body and having the other end disposed in a cylindrical aperture formed in the other of said bodies, and means rotatably retaining said pin within said aperture. whereby a rocking motion is permitted the second body relative to the longitudinal axis of said magnetizable surface to thereby enable the transducing head to closely follow any traverse surface irregularities therein.

3,890,645

MAGNETIC TRANSDUCER

Richard J. La Manna, Whippany, and Alan K. Jensen, Livingston, both of N.J., assignors to Litton Business Systems, Inc., Pine Brook, N.J.

Continuation of Ser. No. 856,856, Sept. 10, 1969, abandoned, which is a continuation of Ser. No. 487,866, Sept. 16, 1965, abandoned. This application Feb. 12, 1971, Ser. No. 128,602

Int. Cl. G11b *5/12*

U.S. Cl. 360—117 **7 Claims**

1. A transducer device for manually scanning a magnetic record, said device comprising:

a magnetic core structure having a generally U-shaped portion, the ends thereof being connected by a generally straight portion,

said straight portion being arcuately contoured in a direction generally transverse to the length thereof and being provided with a gap extending generally at an oblique angle to said length;

electrical coil means wound upon said magnetic core structure to provide for the transduction of a magnetically induced signal; and

means for manually moving said device with respect to said magnetic record.

DESIGN PATENTS

GRANTED JUNE 17, 1975

ERRATA

For CLASS	See PATENT NO.
006–209	235,413
019–076	235,425
026–014.00K	235,449

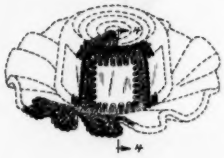
DESIGNS

JUNE 17, 1975

235,389
BRASSIERE
Julie Newmar, 12 Beekman Place, New York, N.Y. 10022
Filed Mar. 7, 1974, Ser. No. 449,047
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—24

235,390
BRASSIERE
Julie Newmar, 12 Beekman Place, New York, N.Y. 10022
Filed Apr. 12, 1974, Ser. No. 460,447
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—24

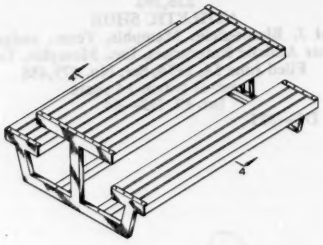
235,391
CROCHETED HAT
Alta Marie Somen, Northlake, Ill., assignor to Caron International Inc., Rochelle, Ill.
Filed Jan. 21, 1974, Ser. No. 435,255
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—257



235,392
ATHLETIC SHOE
Michael J. Blumenfeld, Memphis, Tenn., assignor to Comar Athletic Enterprises, Inc., Memphis, Tenn.
Filed June 14, 1974, Ser. No. 479,488
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—311

235,393
DISPLAY STAND
Roland E. Loomis, Menlo Park, Calif., assignor to House of Health, Inc., Santa Clara, Calif.
Filed July 12, 1973, Ser. No. 378,784
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—24

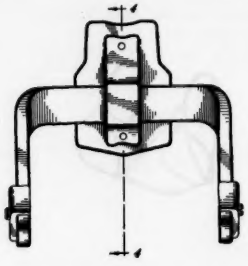
235,394
PICNIC TABLE
Douglas M. Ruth, 1212 E. Broward Blvd., Fort Lauderdale, Fla. 33301
Filed Nov. 16, 1973, Ser. No. 416,455
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—45



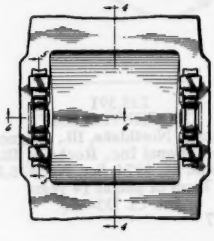
235,395
CHAIR
Morris F. Fisher, Carmel, Ind., assignor to Futorian Corporation, Amsterdam, N.Y.
Filed Feb. 26, 1973, Ser. No. 336,127
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71

235,396
CHAIR
Kunio Onoguchi, Tokyo, Japan, assignor to France Bed Co., Ltd., Tokyo, Japan
Filed Feb. 28, 1973, Ser. No. 336,501
Term of patent 3½ years
Int. Cl. D6—*01*
U.S. Cl. D6—76

235,397
TISSUE HOLDER
Raymond U. H. Tegner, Lodi, Wis., and Robert W. Johnson, Rockford, Ill., assignors to Amerock Corporation, Rockford, Ill.
Filed Dec. 26, 1973, Ser. No. 428,244
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—97



235,398
RECESSED TISSUE HOLDER
Raymond U. H. Tegner, Lodi, Wis., assignor to Amerock Corporation, Rockford, Ill.
Filed Dec. 26, 1973, Ser. No. 427,839
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—97

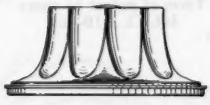


235,399
CONTAINER FOR ROOTING PLANT CUTTINGS
Joyce Malnekoff, 1360 Sherwood, Highland Park, Ill. 60035
Filed Jan. 4, 1974, Ser. No. 430,660
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D6—113

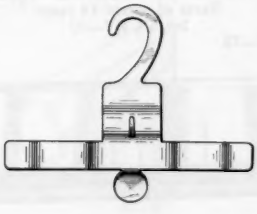
235,400
STANDARD AND BRACKET COMBINATION
Eugene Brown, 14 Willets Court, Rockville Centre, N.Y. 11570
Original design application Feb. 25, 1972, Ser. No. 229,622, now Patent No. 231,295. Divided and this application Apr. 4, 1974, Ser. No. 457,421
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—114

235,401
GARMENT HOOK
Raymond U. H. Tegner, Lodi, Wis., and Robert W. Johnson, Rockford, Ill., assignors to Amerock Corporation, Rockford, Ill.
Filed Dec. 26, 1973, Ser. No. 427,842
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D6—120

235,402
COMBINED COVER AND FOOD MOLD INSERT
James B. Swett, Barrington, R.I., and Richard A. Boucher, Northboro, Mass., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Jan. 24, 1974, Ser. No. 436,325
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—131

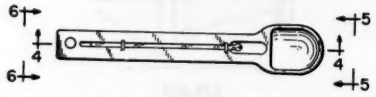


235,403
HINGED SKIRT AND TROUSER HANGER
Dwight C. Brown, 5712 N. 20th St., Arlington, Va. 22205
Filed Mar. 1, 1974, Ser. No. 447,301
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—252

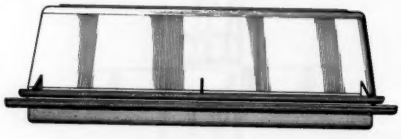


235,404
FOOD MOLD
James B. Swett, Barrington, R.I., and Richard A. Boucher, Northboro, Mass., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Jan. 24, 1974, Ser. No. 436,324
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—43

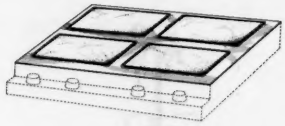
235,405
TEMPERATURE MEASURING SPOON
Lester Brown, Flushing, and Frederick J. Burg, Bellerose, N.Y., Robert Dziekonski, Fort Lee, N.J., and Michael Lax, New York, N.Y., assignors to Salton, Inc., Bronx, N.Y.
Filed Oct. 10, 1972, Ser. No. 296,035
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D7—50



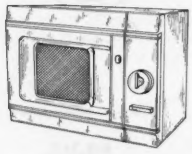
235,406
COMBINED FOOD STORAGE AND SERVING DISH
Robert Daenen, Erembodegem, Belgium, assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Jan. 9, 1974, Ser. No. 432,025
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—76



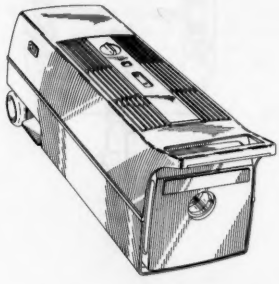
235,407
RANGE TOP
Jack J. Tyson, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Mar. 29, 1971, Ser. No. 129,290
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—121



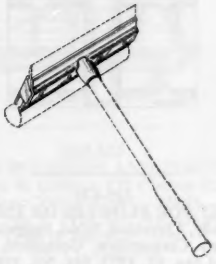
235,408
ELECTRONIC COOKING RANGE
Yoshio Suganoya and Takao Miyake, Osaka, Japan, assignors to Sharp Kabushiki Kaisha (Sharp Corporation), Osaka, Japan
Filed June 20, 1973, Ser. No. 371,751
Claims priority, application Japan Dec. 26, 1972
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—128



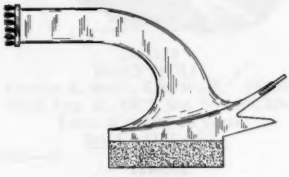
235,409
SUCTION CLEANER OR THE LIKE
Martin James Mims, 35 Rockmount Road, Upper Norwood, London SE. 19, England
Filed Aug. 6, 1973, Ser. No. 385,998
Claims priority, application Great Britain May 4, 1973
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D7—168



235,410
CLAMPING ARRANGEMENT FOR A COMBINED SQUEEGEE AND SPONGE DEVICE
Maurice J. Epstein, University Heights, Ohio, assignor to Dorothy Epstein, University Heights, Ohio
Filed June 13, 1973, Ser. No. 369,433
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—178

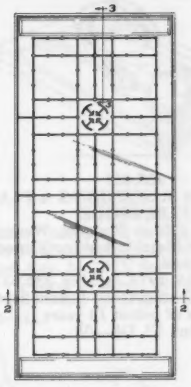


235,411
GLASS CLEANING DEVICE
Brian D. Savage, 319 Poplar Place, Birmingham, Ala. 35209
Filed Sept. 24, 1973, Ser. No. 400,252
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—179

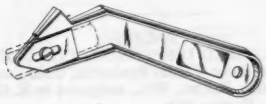


235,412
FIREPLACE GRATE
Richard W. Mellow, Jr., Ladue, Mo., assignor to Liberty Foundry Co.
Filed Mar. 6, 1974, Ser. No. 448,546
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D7—207

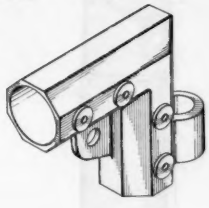
235,413
PLASTIC FLOOR MATTING
Ralph W. Murphy, Marietta, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio
Filed Nov. 29, 1973, Ser. No. 420,006
Term of patent 14 years
Int. Cl. D16—*13*
U.S. Cl. D6—209



235,414
CARPET KNIFE
Robert G. Miller, Janesville, Wis., assignor to Nancy Eastman, Footville, Wis.
Filed Aug. 14, 1973, Ser. No. 388,162
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—98

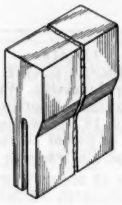


235,415
COMBINATION GATE HINGE AND CORNER
Leo J. Martini, South Gate, Calif., assignor to Master Fence Fittings, Inc., La Habra, Calif.
Filed May 6, 1974, Ser. No. 467,393
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—191

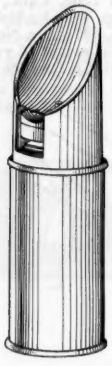


235,416
CLAMP
William A. Fortsch, Livingston, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.
Filed Apr. 8, 1974, Ser. No. 458,853
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—229

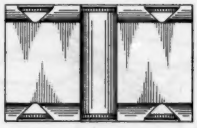
235,417
HANGER BAR FOR SUSPENDING A PLATE-TYPE ELECTRODE
David Francis John Triston Rodgers, Warley, England, assignor to Imperial Metal Industries (Kynoch) Limited, Warwickshire, England
Filed Feb. 15, 1973, Ser. No. 332,637
Claims priority, application Great Britain Sept. 20, 1972
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—259



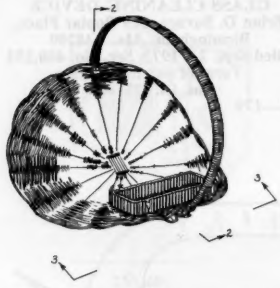
235,418
PRESSURIZED DISPENSING CONTAINER
Tor Petterson, Palos Verdes Peninsula, Calif., and Ronald R. Gutkowski, Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Nov. 29, 1973, Ser. No. 420,042
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—9



235,419
CONTAINER PACKAGE
Glen R. Harrelson, Monroe, La., assignor to Olinkraft, Inc., West Monroe, La.
Filed Jan. 15, 1973, Ser. No. 323,808
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—193



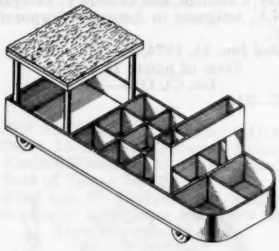
235,420
BASKET FOR FLOWERS OR THE LIKE
Ernest O. Brody, Cleveland, Ohio, assignor to Lancaster Colony Corporation, Columbus, Ohio
Filed Jan. 31, 1973, Ser. No. 328,318
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—247



235,421
WRIST WATCH
Nicholas G. Pitrelli, 97—48 107th St., Ozone Park, Long Island, N.Y. 11416
Filed May 11, 1973, Ser. No. 359,556
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39

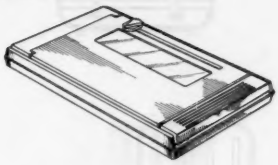
235,422
HOUSING FOR BOTTOM CURRENT METER
Shale J. Niskin, 2941 Lucaya St., Miami, Fla. 33133
Filed Apr. 1, 1974, Ser. No. 456,728
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—96

235,423
CADDY FOR PLUMBERS AND ELECTRICIANS
Elmer H. Gullion, 115 Chester St., Grass Valley, Calif. 95945
Filed Feb. 1, 1974, Ser. No. 438,619
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—29

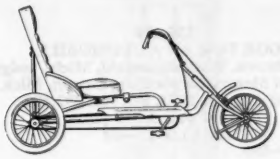


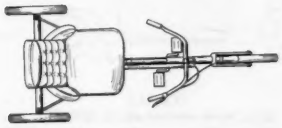
235,424
BOAT HULL
Leedice S. Smith, Elk, Wash. 99009
Filed Aug. 23, 1973, Ser. No. 390,890
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62

235,425
LIST FINDER
Chuzo Mori, Tokyo, Japan, assignor to Carl Manufacturing Company, Ltd., Tokyo, Japan
Filed Feb. 26, 1973, Ser. No. 336,050
Claims priority, application Japan Sept. 6, 1972
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76

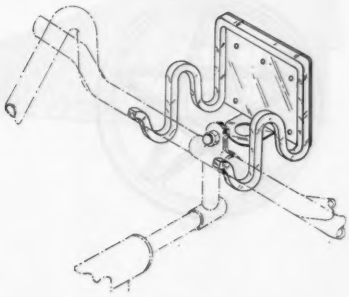


235,426
TRICYCLE
Dean H. Foster, 5835 E. 21st Place, and George R. Foster, 4619 E. 25th St., both of Tulsa, Okla. 74114
Filed Aug. 24, 1973, Ser. No. 391,263
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—112



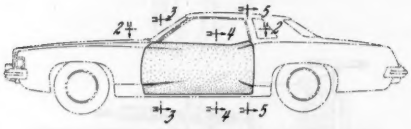


235,427
BICYCLE HANGER
Alexander L. Generalis, and Michael C. Roberto, both of 249 S. 10th St., Philadelphia, Pa. 19107
Filed May 11, 1973, Ser. No. 359,215
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D12—115



235,428
CAR TOP LUGGAGE CARRIER
Donald G. Hart, R.R. 1, Geneseo, Ill. 61254
Filed Nov. 8, 1973, Ser. No. 413,876
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157

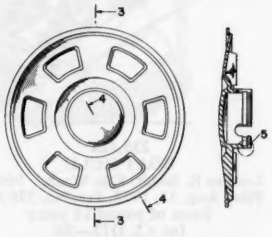
235,429
DOOR FOR AN AUTOMOBILE
Gordon M. Brown, West Bloomfield, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 29, 1973, Ser. No. 392,422
Term of patent 3½ years
Int. Cl. D12—*08*
U.S. Cl. D12—196



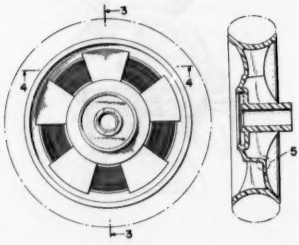
235,430
MOTORCYCLE WHEEL
Delmer D. Scott, Encino, Calif., assignor to Shelby Dowd Industries, Inc., Marina Del Rey, Calif.
Filed Mar. 25, 1974, Ser. No. 454,226
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—205

235,431
MOTORCYCLE WHEEL
Delmer D. Scott, Encino, Calif., assignor to Shelby Dowd Industries, Inc., Marina Del Rey, Calif.
Filed June 21, 1974, Ser. No. 483,936
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—205

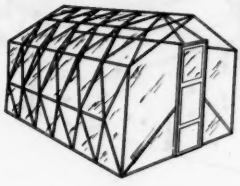
235,432
WHEEL COVER
Joseph R. May, Chatham, and Donald F. Morgan, Bloomingdale, N.J., assignors to Amerace Corporation, New York, N.Y.
Filed Jan. 23, 1974, Ser. No. 435,888
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



235,433
WHEEL CENTER
Joseph R. May, Chatham, and Donald F. Morgan, Bloomingdale, N.J., assignors to Amerace Corporation, New York, N.Y.
Filed Feb. 13, 1974, Ser. No. 442,150
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211

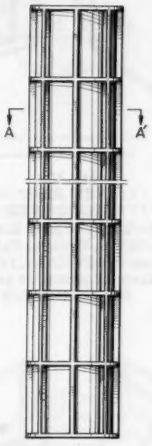


235,434
BUILDING
Richard J. Hemmelsbach, Spring Lake, Mich., assignor to Space Age Industries, Inc., West Olive, Mich.
Filed Mar. 20, 1973, Ser. No. 342,948
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 R



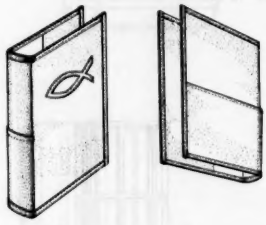
235,435
HOLLOW METALLIC CONSTRUCTION PILE
Akemasa Otani, 23–14, 204, Takanawa 3-chome, Minato-ku, and Kenichi Watanabe, 23–19, Kamiikedai 4-chome, Ota-ku, both of Tokyo, Japan
Filed Apr. 27, 1972, Ser. No. 248,352
Claims priority, application Japan Oct. 30, 1971
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1 H

235,436
HOLLOW METALLIC CONSTRUCTION PILLAR
Akemasa Otani, 23–14, 204, Takanawa 3-chome, Minato-ku, and Kenichi Watanabe, 23–19, Kamiikedai 4-chome, Ota-ku, both of Tokyo, Japan
Filed Apr. 27, 1972, Ser. No. 248,353
Claims priority, application Japan Oct. 30, 1971
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1 H

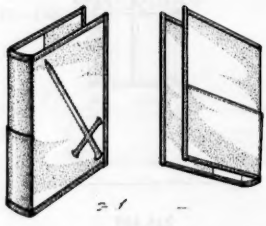


235,437
STORE BUILDING FACADE
Joseph Binder, Oceanside, and Carrl Palestini, Lido Beach, N.Y., assignors to The Bohack Corporation, Brooklyn, N.Y.
Filed Aug. 16, 1972, Ser. No. 281,141
(Filed under Rule 47(a) and 35 U.S.C. 116)
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 B

235,438
BOOK COVER
Gregg L. Gray, Laguna Beach, Calif.
(1117 W. Struck, Orange, Calif. 92667)
Filed Aug. 22, 1973, Ser. No. 390,505
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—26

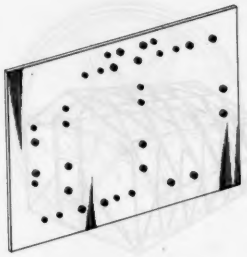


235,439
BOOK COVER
Gregg L. Gray, Laguna Beach, Calif.
(1117 W. Struck, Orange, Calif. 92667)
Filed Aug. 23, 1973, Ser. No. 390,743
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—26



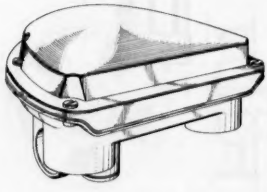
235,440
EDUCATIONAL PLUG-IN BOARD
Charles G. Valentine, Stamford, Conn., assignor to Xerox Corporation, Stamford, Conn.
Filed Apr. 20, 1973, Ser. No. 353,187
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—62

235,441
BASIC MEASUREMENT EDUCATIONAL BOARD
Charles G. Valentine, Stamford, Conn., assignor to Xerox Corporation, Stamford, Conn.
Filed Apr. 27, 1973, Ser. No. 355,224
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—62

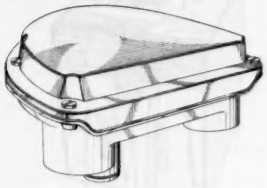


235,442
FISH LURE
Earl E. Miller, Knoxville, Tenn., assignor to Brunswick Corporation, Skokie, Ill.
Filed Sept. 17, 1973, Ser. No. 397,958
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

235,443
PRESSURE REGULATOR OR SIMILAR ARTICLE
Dwight N. Johnson and Theodore E. Kwast, Anaheim, Calif., assignors to The Singer Company, New York, N.Y.
Filed May 30, 1973, Ser. No. 365,338
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—21

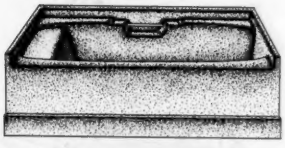


235,444
PRESSURE REGULATOR OR SIMILAR ARTICLE
Dwight N. Johnson and Theodore E. Kwast, Anaheim, Calif., assignors to The Singer Company, New York, N.Y.
Filed June 11, 1973, Ser. No. 368,896
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—21



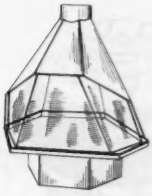
235,445
SHOWER HEAD
Frederick Gordon Mackay, Tarzana, Gerald William Lee, Glendale, and Allan Bernard Johnson, Tarzana, Calif., assignors to Teledyne Industries, Inc., doing business as Teledyne Aqua Tec Co., Fort Collins, Colo.
Filed Dec. 17, 1973, Ser. No. 425,163
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35

235,446
BATHTUB
Stanley F. Korol, Mansfield, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Aug. 20, 1973, Ser. No. 389,904
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55

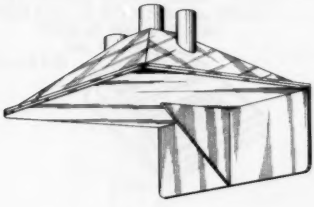


235,447
FREESTANDING FIREPLACE
Paul H. Lever, P.O. Box 1289, Fallbrook, Calif. 92028
Filed Dec. 6, 1973, Ser. No. 422,279
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

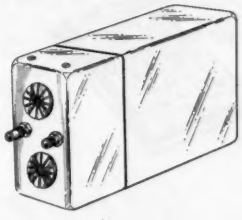
FIG.



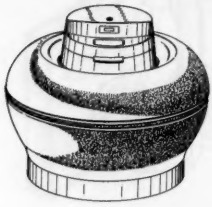
235,448
HUMIDIFIER HOUSING FOR ATTACHMENT TO A COMBUSTION SYSTEM
Fred A. Wentworth, Jr., 20 Heights Road, Stratham, N.H. 03885
Filed June 17, 1974, Ser. No. 480,238
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—147



235,449
MINIATURE RADIO RECEIVER
Jack N. Holcomb, P.O. Box 23130, Fort Lauderdale, Fla. 33307
Filed Apr. 19, 1973, Ser. No. 352,619
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 K



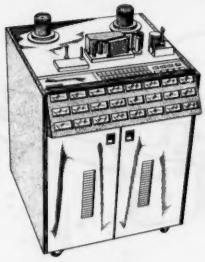
235,450
VAPORIZER HUMIDIFIER
David Chapman, Chicago, Ill., assignor to Gerber Products Company, Fremont, Mich.
Filed Apr. 22, 1974, Ser. No. 463,005
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—148



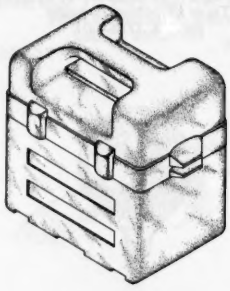
235,451
CALCULATING MACHINE OR SIMILAR ARTICLE
Minoru Ishikawa, Kyoto, Japan, assignor to Omron Tateisi Electronics Co.
Filed Aug. 24, 1973, Ser. No. 391,045
Claims priority, application Japan Mar. 15, 1973
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C

235,452
ELECTRONIC CALCULATING MACHINE
Matafumi Ikeda, Osaka, Japan, assignor to Sharp Kabushiki Kaisha (Sharp Corporation), Osaka, Japan
Filed Aug. 31, 1973, Ser. No. 393,651
Claims priority, application Japan Mar. 19, 1973
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C

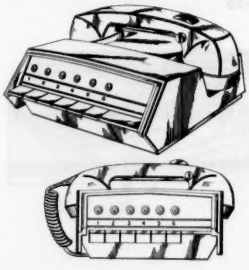
235,453
MAGNETIC TAPE TRANSPORT
Albert W. Martin, 3775 Pinewood Place, Santa Clara, Calif. 95050
Filed Feb. 11, 1974, Ser. No. 441,395
Term of patent 3½ years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



235,454
BATTERY CARRIER
Albert A Lindow, Jr., 1761 Brett Ave., Pittsburgh, Pa. 15205
Filed Sept. 10, 1973, Ser. No. 395,768
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D26—6



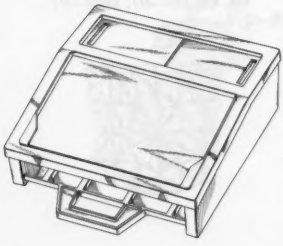
235,455
MULTIPLE LINE REMOTE DICTATION RECORDING STATION OR SIMILAR ARTICLE
David K. Walz, Atlanta, Ga., assignor to Lanier Electronic Laboratory, Inc., Atlanta, Ga.
Filed Jan. 9, 1974, Ser. No. 432,056
Term of patent 14 years
Int. Cl. D14
U.S. Cl. D26—14 A



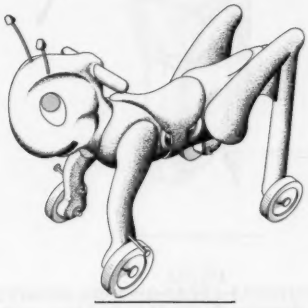
235,456
LIGHTER
Conrad Zellweger, Chene-Bougeries, Switzerland, assignor to La Nationale S.A., Geneva, Switzerland
Filed Sept. 11, 1973, Ser. No. 396,214
Claims priority, application Switzerland Apr. 11, 1973
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—36

235,457
LIGHTER
Masaaki Takashima, 12–10, 2-chome, Mejiro, Toshima-ku, Tokyo, Japan
Filed Apr. 18, 1974, Ser. No. 461,850
Claims priority, application Japan Oct. 23, 1973
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

235,458
TOY DESK
Victor G. Reiling, Jr., East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Dec. 6, 1972, Ser. No. 312,593
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 A

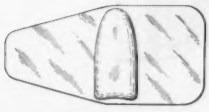


235,459
FIGURE RIDING TOY
Rouben T. Terzian and Kathy Dunn, Chicago, Ill., and Laurie Jay Campbell, Erie, Pa., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Apr. 18, 1974, Ser. No. 461,950
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ

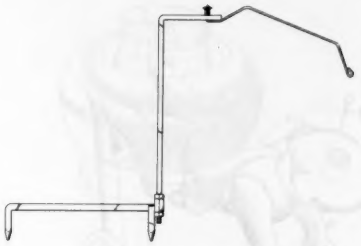


235,460
INFLATABLE CUSHION PAD FOR A GOLF BAG SHOULDER STRAP OR THE LIKE
Bill N. Lovelace and Frank A. Pritchard, both of 2215 Bennett, Wichita, Kans. 67213
Filed Feb. 12, 1973, Ser. No. 331,354
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GB

235,461
PUTTING AID ATTACHMENT FOR A GOLF CLUB SHAFT
Anthony J. Prisco, Sr., Woodcliff Lake, N.J. (102 Beech St., Westwood, N.J. 07675)
Filed Aug. 27, 1973, Ser. No. 391,738
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB



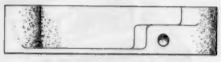
235,462
FOOTBALL KICKING TEE
Albert W. Pennington, 52 Pinewood Drive, Farmington, Conn. 06032
Filed Aug. 20, 1973, Ser. No. 390,117
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 GT



235,463
COMBINED TENNIS BALL RETRIEVER AND STORAGE CONTAINER
Frederick D. Heffner, San Gabriel, Calif. (2350 Huntington Drive, San Marino, Calif. 91108)
Filed Sept. 4, 1973, Ser. No. 393,992
Term of patents 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 ST

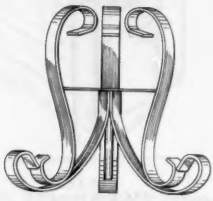
235,464
TOY BAT
Samuel F. Speers, 120 Mount Hope St., North Attleboro, Mass. 02703
Filed Oct. 1, 1973, Ser. No. 402,615
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D34—5 BC

235,465
HEAD FOR A GOLF PUTTER
Tony J. Vella, 3504 Wesleyan Ave., Rockford, Ill. 61108
Filed Oct. 5, 1973, Ser. No. 403,847
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

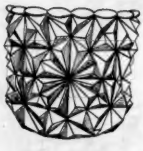


235,466
FINGER RING
George Volkhausen, 79 Albert Ave., Cranston, R.I. 02905
Filed Oct. 25, 1973, Ser. No. 409,642
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—10 A

235,467
CANDLE HOLDER
Lon H. Wilkie, Jr., 6092 Estes St., Arvada, Colo. 80002
Filed Mar. 21, 1973, Ser. No. 343,567
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D48—2



235,468
CANDLEHOLDER
Preston J. Frazier, Jr., Houston, Tex., assignor to Faroy, Inc., Houston, Tex.
Filed July 12, 1973, Ser. No. 378,611
Term of patent 14 years
Int. Cl. D7—*01*; D26—*01*
U.S. Cl. D48—2

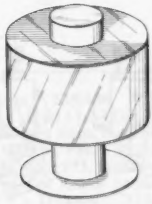


235,469
CANDLEHOLDER
Preston J. Frazier, Jr., Houston, Tex., assignor to Faroy, Inc., Houston, Tex.
Filed Aug. 30, 1973, Ser. No. 393,150
Term of patent 14 years
Int. Cl. D7—*01*; D26—*01*
U.S. Cl. D48—2

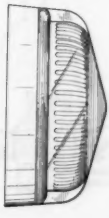
235,470
COMBINED READING AND EXAMINATION LIGHT AND SUPPORT THEREFOR
Mitchell Bobrick, Redondo Beach, and Mel Evenson, Santa Monica, Calif., and Morris M. Buzan, St. Charles, and Murray L. Quin, St. Louis, Mo.; said Buzan and Quin assignors to Emerson Electric Co.
Filed July 5, 1973, Ser. No. 376,542
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 H

235,471
FLASHLIGHT
John H. Squadra, Rowayton, Conn., assignor to The Ashflash Corporation, South Norwalk, Conn.
Filed July 1, 1974, Ser. No. 484,415
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A

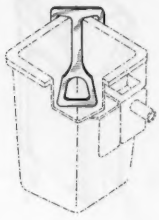
235,472
OUTDOOR GROUND LEVEL LIGHTING FIXTURE
Hans Paul Ludwig Geisler, Norderstedt, Germany, assignor to Deutsche Texaco Aktiengesellschaft
Filed Apr. 24, 1972, Ser. No. 247,252
Term of patent 14 years
Int. Cl. D26—*03, 05*; D20—*03*; D6—*01*
U.S. Cl. D48—31



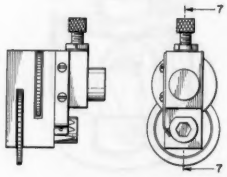
235,473
COMBINED CLEARANCE AND MARKER LAMP
Robert I. Nagel, Skokie, Ill., assignor to Dominion Auto Accessories Limited, Toronto, Ontario, Canada
Filed Jan. 2, 1974, Ser. No. 430,199
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 R



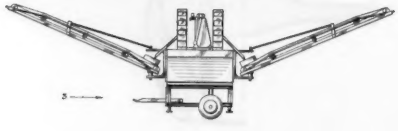
235,474
BUCKET STEP FOR AN AERIAL LIFT BUCKET AND LINER
Louis J. Kachavos, New Boston, N.H., assignor to Plastic Techniques, Inc., New Boston, N.H.
Filed May 23, 1974, Ser. No. 472,623
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D54—1 A



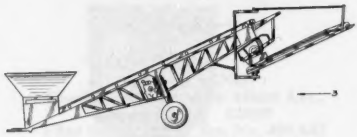
235,475
DIAMOND HOLDING TOOL
Herbert Waldman, 1739 52nd St. 11204, and Joseph Waldman, 989 Montgomery St. 11213, both of Brooklyn, N.Y.
Filed Feb. 2, 1973, Ser. No. 328,901
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D54—13 A



235,476
ARTICULATED CONVEYOR UNIT
Patrick O'Neill and Patrick Joseph Douglas, Dungannon, Northern Ireland, assignors to Powerscreen International Limited
Filed Mar. 14, 1973, Ser. No. 341,256
Claims priority, application Great Britain Aug. 26, 1972
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D55—1 C

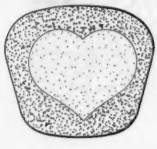


235,477
ARTICULATED CONVEYOR UNIT
Patrick O'Neil and Patrick Joseph Douglas, Dungannon, Northern Ireland, assignors to Powerscreen International Limited
Filed Mar. 14, 1973, Ser. No. 341,258
Claims priority, application Great Britain Aug. 26, 1972
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D55—1 C

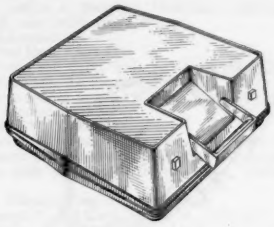


235,478
MICROSCOPE STAND
John T. Armbruster, Niagara Falls, N.Y., assignor to American Optical Corporation, Southbridge, Mass.
Filed Mar. 21, 1973, Ser. No. 343,583
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 E

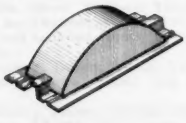
235,479
NOVELTY LENS FOR SUNGLASSES
José Canato Filho, Caixa Postal, 706, 15100-Sao do Rio Preto, Sao Paulo, Brazil
Filed Aug. 10, 1973, Ser. No. 387,273
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 A



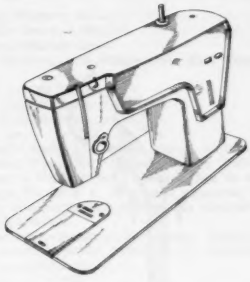
235,480
PORTABLE TYPEWRITER
Karl T. Baughman, Lake Forest, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.
Filed Mar. 12, 1973, Ser. No. 340,328
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 A



235,481
FIXTURE FOR A ROOF PENETRATION MEMBER
John N. Rave, Hales Corners, and John A. Jobst, Milwaukee, Wis., assignors to Inland-Ryerson Construction Products Company, Milwaukee, Wis.
Filed Mar. 29, 1973, Ser. No. 346,178
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D68—1

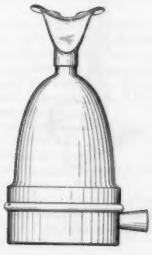


235,482
SEWING MACHINE FRAME OR SIMILAR ARTICLE
Donald M. Genaro, Haworth, N.J., assignor to The Singer Company, New York, N.Y.
Filed Jan. 7, 1974, Ser. No. 431,588
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D70—1

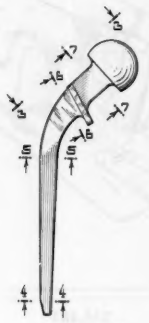


235,483
EAR PLUG
Charles Leight, 5336 W. Pico Blvd., Los Angeles, Calif. 90019
Filed Jan. 11, 1973, Ser. No. 322,746
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 J

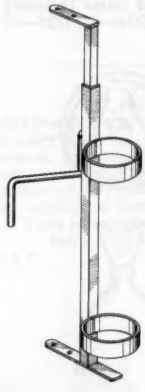
235,484
INHALATOR
Mario Baro and Carmen Baro, both of 8450 SW. 21st St., Miami, Fla. 33155
Filed Feb. 23, 1973, Ser. No. 335,324
Term of patent 14 years
Int. Cl. D24—*02*; D23—*01*
U.S. Cl. D83—1 N



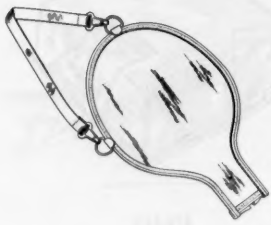
235,485
FEMORAL HIP PROSTHESIS
Harlan C. Amstutz, 433 Burlingame Ave., Los Angeles, Calif.
Filed June 7, 1973, Ser. No. 368,414
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D83—1 E



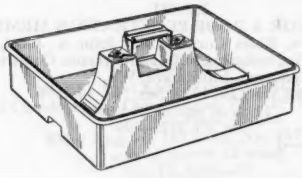
235,486
OXYGEN BOTTLE HOLDER FOR MEDICAL USE
Hugo H. van den Bergh, 7103 Werner St., San Diego, Calif. 92122
Filed Dec. 20, 1973, Ser. No. 426,511
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1 B



235,487
TENNIS RACKET JACKET
Robert J. Rivera, 424 Atlantic Ave., Brooklyn, N.Y. 11217
Filed Aug. 15, 1973, Ser. No. 388,423
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



235,488
CARRIER TRAY
Calvin D. Swalm, 8930 Heraldry St., San Diego, Calif. 92123
Filed Dec. 26, 1973, Ser. No. 427,642
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF JUNE, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Emery Company, The: *See—*
Bradley, Chester D., 3,889,529.

A. H. Robins Company, Incorporated: *See—*
Lerner, Irwin S., 3,889,666.

A J M Research Corporation: *See—*
Malavazos, Arthur J., deceased; Malavazos, administrator, by Gregory A.; and Urdal, Jan, 3,890,491.

A. W. Chapman Limited: *See—*
Adams, Albert John, 3,889,913.

Abbondio, Antonio; and Celio, Tino, to Gretag Aktiengesellschaft. Method and apparatus for measuring the color density of printing inks applied to a moving web. 3,890,048, Cl. 356-199.000.

ACF Industries, Incorporated: *See—*
Peters, Clifford M., 3,889,922.
Sittner, Edward H., Jr.; and Girard, Robert R., 3,889,783.

Achenbach, Dieter; and Siegfried, Joswig, to Wolf-Gerate GmbH. Grass shears with an electric motor drive. 3,889,373, Cl. 30-233.000.

Acme-Hamilton Manufacturing Corporation: *See—*
Bauman, Joseph F.; and Elson, Arthur M., 3,889,830.

Adams, Albert John, to A. W. Chapman Limited. Seat slide mechanism. 3,889,913, Cl. 248-430.000.

Adams, Robert E., to J. W. Greer, Inc. Homogenizer-mixer. 3,889,931, Cl. 259-96.000.

Adams, Samuel F.; and Guerin, Robert J., to American Paper Tube Company. Incrementally-tapered bobbins. 3,889,899, Cl. 242-118.320.

Adams, Sidney George William; and Galliford, Edgar Horace, to James Burn Bindings Limited. Machines for binding packets of perforated sheets. 3,889,309, Cl. 11-1.00A.

Addington Laboratories, Inc.: *See—*
Jeong, David Hoy, 3,890,582.

Addressograph-Multigraph Corporation: *See—*
McVey, Charles W., 3,889,593.

Adler, Martin H.: *See—*
Feren, Morton, 3,890,044.

Admiral Corporation: *See—*
Maleck, Leroy Robert, 3,889,419.

Advance Enterprises, Inc.: *See—*
Faltin, Hans G., 3,889,939.

Advance Oil and Gas Co., Inc.: *See—*
Davis, JLee, 3,890,593.

Advanced Chemical Technology: *See—*
Simon, Alvin L.; and Butz, Klaus S., 3,889,839.

Advanced Technology Laboratories, Inc.: *See—*
Ferri, Antonio, 3,890,088.

AE&CI Limited: *See—*
Coetzee, Josef Erasmus, 3,889,571.

Aengenheister, Joerg, to Siemens Aktiengesellschaft. Apparatus for producing epitaxial layers. 3,889,635, Cl. 118-421.000.

Aerojet-General Corporation: *See—*
Beichel, Rudi; and O'Brien, Charles J., 3,889,462.
Luscher, Werner P., 3,889,775.

Aerosonic Corporation: *See—*
Owens, Frederick J.; Bishop, Jerry B.; and Fidelman, David, 3,889,387.

AFA Corporation, The: *See—*
Uroshevich, Miroslav; Powers, Richard T.; and Sperber, Raymond L., 3,889,847.

AG-Water, Inc.: *See—*
Harrell, Gary W., 3,890,236.

Agence National de Valorisation de la Recherche (ANVAR): *See—*
Gautherin, Guy; and Aubert, Jean, 3,890,535.

Agrico Chemical Company: *See—*
Minor, John T., 3,890,097.

Ahlgren, Nils Harald. Methods for shifting loads. 3,889,926, Cl. 254-1.000.

Ahonen, Aarre, to Oy Wartsila AB. Door arrangement. 3,889,421, Cl. 49-395.000.

Air-Trol Systems, Inc.: *See—*
Edes, Ferenc; and Gianatasio, Henry L., 3,889,895.

Aisin Seiki Kabushiki Kaisha: *See—*
Kazaoka, Kenichi; Hirose, Kimiharu; Takeshita, Yasuo; Matsumoto, Hisao; and Okamoto, Kazuo, 3,889,971.
Uozake, Seizo; and Sakashita, Hitoshi, 3,889,615.

Aizawa, Tsuneo: *See—*
Sato, Masao; Aizawa, Tsuneo; Ohnishi, Kenji; Koizumi, Shigeo; Fukuda, Akio; Kikuchi, Shinki; and Kusanagi, Shichiro, 3,889,561.
Sato, Masso; Aizawa, Tsuneo; Ohnishi, Kenji; Koizumi, Shigeo; Fukuda, Akio; Kikuchi, Shinki; and Kusanagi, Shichiro, 3,889,567.

Aki, Osami: *See—*
Ochiai, Michihiko; Aki, Osami; Morimoto, Akira; Okada, Taiiti; and Masuda, Katsutada, 3,890,309.

Akiyama, Masanori: *See—*
Suzuki, Takeshi; Tanaka, Hiroshi; and Akiyama, Masanori, 3,890,151.

Aktiebolaget Henry Hulthen: *See—*
Hulthen, Martin Henry, 3,889,313.

Aktiebolaget Platmanufaktur: *See—*
Grahn, Per Herbert; and Hakansson, Karl Gustav Eugen, 3,889,442.

Aktiengesellschaft Adolph Saurer: *See—*
Porter, Allan William Henry, 3,889,720.
Porter, Allan William Henry, 3,889,722.

Al-hassan, Saieba: *See—*
Wood, Hamish Christopher Swan; Stuart, Alexander; Curran, Adrian Charles Ward; and Al-hassan, Saieba, 3,890,387.

Albertazzi, Gastone, to Finike Italiana Marposs, Soc. In Accomandita Semplice di Mario Possati & C. Automatic measuring machine for checking similar workpieces with at least one dimension different. 3,889,380, Cl. 33-174.00L.

Alden, John M., to Alden Research Foundation. Sealed cassette for moist facsimile recording paper. 3,890,622, Cl. 346-74.00E.

Alden Research Foundation: *See—*
Alden, John M., 3,890,622.

Aldridge, Clyde L., to Exxon Research and Engineering Company. Two-stage process for the conversion of liquid hydrocarbon to a methane rich gas stream. 3,890,112, Cl. 48-214.000.

Alexander, Sell, Steldt & DeLaHunt: *See—*
Nelson, Norman E., 3,889,900.

Alimenti, Giovanni: *See—*
Portinari, Antonio; and Alimenti, Giovanni, 3,889,455.

Allen, Archelaius Dawson, to Gullick Dobson Limited. Mine roof supports. 3,889,475, Cl. 61-45.00D.

Allen, Edgar Robert, to Post Office, The. Measurement of noise in a communication channel. 3,890,470, Cl. 179-15.0BF.

Allen and Hanburys Limited: *See—*
Middlemiss, David, 3,890,347.

Allen West and Company, Limited: *See—*
Evans, John Richard, 3,889,878.

Allied Chemical Corporation: *See—*
Bingham, Alex John; Haylock, John Christopher; and Lofquist, Robert Alden, 3,890,286.
Ousterling, David L.; and Jones, Harold F., 3,889,696.

Allmanna Svenska Elektriska Aktiebolaget: *See—*
Chamia, Michel, 3,890,544.

Aluminum Company of America: *See—*
Burkhardt, Daniel J., 3,889,451.
Kordis, Thomas J., 3,890,166.
Matocha, Charles K., 3,890,089.

Alvarez, Jose R., to du Pont de Nemours, E. I., and Company. Preparation of thiohydroximate carbamates. 3,890,362, Cl. 260-453.00R.

Amada Company Limited: *See—*
Sato, Masao; Aizawa, Tsuneo; Ohnishi, Kenji; Koizumi, Shigeo; Fukuda, Akio; Kikuchi, Shinki; and Kusanagi, Shichiro, 3,889,561.
Sato, Masso; Aizawa, Tsuneo; Ohnishi, Kenji; Koizumi, Shigeo; Fukuda, Akio; Kikuchi, Shinki; and Kusanagi, Shichiro, 3,889,567.

Amaya, Toshiyuki, to Pioneer Electric Corporation. Automatic chord performance apparatus for a chord organ. 3,889,568, Cl. 84-1.010.

Ambier, Jean: *See—*
Pelenc, Yves; Ambier, Jean; and Lavergne, Roger, 3,890,607.

American Aniline Products, Inc.: *See—*
Genta, Guido R., 3,890,094.

American Bioculture, Inc.: *See—*
Porter, Kenneth E.; and Nelson, Perry L., 3,889,418.

American Can Company: *See—*
Schlesinger, Sheldon Irwin; Boszak, Ronald J.; Shuppert, Laurence Verlan; and Cowling, Richard James, 3,890,149.

American Cyanamid Company: *See—*
Bann, Robert Francis; Moran, William Joseph; and Roth, Philip B., 3,890,095.
Casey, Donald James; and Epstein, Martin, 3,890,283.
Gordon, John Edson; and Halmos, Imre Aurel, 3,890,341.

American Home Products Corporation: *See—*
Cayen, Mitchell N.; and Dvornik, Dushan M., 3,890,438.
Foell, Theodore J.; and Yardley, John P., 3,890,437.
Wei, Peter H. L.; and Gochman, Carl, 3,890,311.

American Optical Corporation: *See—*
Denouter, Pieter J.; and Grolman, Bernard, 3,889,518.
Siegmund, Walter P., 3,890,127.

American Paper Tube Company: *See—*
Adams, Samuel F.; and Guerin, Robert J., 3,889,899.

American Potato Company: *See—*
Harmon, James F.; Johnston, Richard D.; Lach, John H.; Von Der Lieth, William H.; and Murphy, Thomas L., 3,890,453.

American Safety Equipment Corporation: *See—*
Close, Albert R., 3,890,003.

Ziv, Avraham, 3,889,898.

AMP Incorporated: *See—*
Shughart, Mervin Leonard, 3,889,337.

Analog Devices, Incorporated: *See—*
Pastoriza, James J., 3,890,611.

Anchor/Darling Valve Company: *See—*
Karpenko, Anatole N., 3,889,924.

Andersen, Kare: *See—*
Daly, Richard H.; Brink, Robert V.; and Andersen, Kare, 3,890,082.

Anderson, Dean K., to Kimberly-Clark Corporation. Fiber waste reclaim system and method. 3,890,220, Cl. 209-3.000.

Anderson, Paul E., to Martin Marietta Aluminum, Inc. Method and means for constructing large tanks. 3,889,836, Cl. 220-5.00A.

Anderson, Paul L., to Sandoz, Inc. Indanyl butadienols. 3,890,396, Cl. 260-618.00F.

Anderson, Robert D., to TCI, Inc. Live bottom chute for spreaders. 3,889,883, Cl. 239-679.000.

Andersson, Claes-Goran Staffan: *See—*
Danielson, Claes Otto Sigfrid; Andersson, Claes-Goran Staffan; and Gram, Hans-Ake Christian, 3,889,450.

Andeweg, Frits J. Illuminated candle structure. 3,890,085, Cl. 431-125.000.

Angstadt, Howard P.; and Bare, John P., to Sun Ventures, Inc. Polymeric catalyst composition for hydrocarbon oxidation. 3,890,281, Cl. 260-77.50C.

Anthony, Donald L. Plural aperture dispenser. 3,889,724, Cl. 141-1.000.

Aoki, Hideo: *See—*
Watanabe, Takashi; Watamura, Koichi; Kawatani, Kazuya; and Aoki, Hideo, 3,890,564.

Aoyama, Toshimi: *See—*
Hasegawa, Masaki; Nakanishi, Fusae; Nakanishi, Hachiro; Watanabe, Shoji; Suzuki, Yasuzo; Nakane, Hisashi; Aoyama, Toshimi; Komatsubara, Yukio; Nojima, Setsuo; and Tagami, Hiroshi, 3,890,150.

Aprahamian, Aida, executrix: *See—*
Aprahamian, Nazar S., deceased, 3,890,390.

Aprahamian, Nazar S., deceased (Aprahamian, Aida, executrix), to Union Carbide Corporation. Process for the production of methyl ketones. 3,890,390, Cl. 260-590.000.

Apstein, Maurice, to United States of America, Army. Fuze. 3,889,599, Cl. 102-70.20P.

Aquila S.p.A.: *See—*
Giangaspero, Michele; Tlustos, Giorgio; and Corsi, Domenico, 3,890,401.

Argentieri, Michael; and Kelso, Robert, to Intercontinental Dynamics Corporation. Integrated radar-pneumatic altimeter display device. 3,890,614, Cl. 343-5.0DP.

Armao, Thomas Anthony. Cryoadhesion preventing cryosurgical instruments. 3,889,680, Cl. 128-303.100.

Armco Steel Corporation: *See—*
Brooks, Robert C., 3,889,925.

Armen, Harry, Jr.: *See—*
Kamins, Jerome H.; Mandell, Michael I.; Armen, Harry, Jr.; and Savet, Paul, 3,890,484.

Armour-Dial, Inc.: *See—*
Kaniecki, Thaddeus John, 3,890,419.

Armstrong Cork Company: *See—*
Ollinger, James C., 3,889,435.

Arndt, Friedrich: *See—*
Puttner, Reinhold; and Arndt, Friedrich, 3,890,385.

Arnold, Robert W. Jet propulsion unit for boats. 3,889,623, Cl. 115-16.000.

Arnold, William J.: *See—*
Bernstein, Herbert J.; and Arnold, William J., 3,890,045.

Aronson, Moses, to United States of America, Navy. Direct fire weapons simulator. 3,889,396, Cl. 35-25.000.

Aronstein, Jesse; and Harding, William E., to International Business Machines Corporation. Continuous processing system. 3,889,355, Cl. 29-569.000.

Arpe, Hans-Jurgen: *See—*
Leupold, Ernst Ingo; and Arpe, Hans-Jurgen, 3,890,366.

Arrow Development Co., Inc.: *See—*
Bacon, Karl W., 3,889,605.

Arwood, Troy W. Mailbox signal apparatus. 3,889,874, Cl. 232-35.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Uno, Naoyuki, 3,890,627.

Asbury, Joseph J., to United States of America, Energy Research and Development Administration. Aluminum titanate crucible for molten uranium. 3,890,140, Cl. 75-84.10R.

Aspinwall, Peter; and Barbour, Richard H., Jr., to Comstock & Wescott, Inc. Knife edge endless loop book cutter. 3,889,564, Cl. 83-174.000.

Assemat, Jean-Louis: *See—*
Pruniaux, Bernard R.; and Assemat, Jean-Louis, 3,890,163.

Astheimer, Karl; and Hug, Karl, to General Motors Corporation. Vehicle body with occupant head-protective curtain. 3,889,970, Cl. 280-150.00B.

Atlas Copco Aktiebolag: *See—*
Kimber, Erich Voldemar, 3,889,906.
Persson, Jan Edvard, 3,889,959.

Atzinger, Mary T. Shoe attachment for operating organ pedals. 3,889,400, Cl. 36-7.500.

Aubert, Jean: *See—*
Gautherin, Guy; and Aubert, Jean, 3,890,535.

Auer, Eberhard: *See—*
Vogt, Wilhelm; Fischer, Edgar; and Auer, Eberhard, 3,890,288.
Vogt, Wilhelm; Auer, Eberhard; Lenz, Gunter; Merkenich, Karl; and Henning, Klaus, 3,890,291.

Automated Construction Industries, Inc.: *See—*
Bourdo, John Lorin, 3,890,075.

Automation Industries, Inc.: *See—*
Fung, James Y., 3,889,642.

Automation & Product Development Corporation: *See—*
Eburn, William H., Jr., 3,890,190.

Automobiles Peugeot: *See—*
Pruvot, Francois C.; Maistrelli, Roger; and Buachet, Pierre, 3,890,360.

Avant, Richard H.; and Webster, Peter R., to BernzOmatic Corporation. One-piece pressure container. 3,889,835, Cl. 220-3.000.

Avery, Carl Frederick, to Marion Health and Safety, Inc. Culture collecting package. 3,890,204, Cl. 195-139.000.

Awata, Norio: *See—*
Ogawa, Yasuhiro; and Awata, Norio, 3,890,312.

Ayora, David Enrique. Container for boiling milk. 3,889,655, Cl. 126-387.000.

B. F. Goodrich Company, The: *See—*
Tanzilli, James D.; and Korney, Arthur F., 3,890,268.

Baba, Kosaku: *See—*
Hosaka, Akio; Baba, Kosaku; and Wazawa, Kiyoshi, 3,890,594.

Babcock, Henry Nash. Cementitious systems incorporating particulate adsorbents. 3,890,157, Cl. 106-89.000.

Babcock & Wilcox Company, The: *See—*
Girardi, Vincent J., 3,889,573.

Bacon, Karl W., to Arrow Development Co., Inc. Amusement ride with a vehicle track portion following the shape of a helix. 3,889,605, Cl. 104-56.000.

Bactomatic Inc.: *See—*
Cady, Paxton, 3,890,201.

Badalex Limited: *See—*
Buchanan, John Brown; Stephens, Stanley William; and Grenfell, Julian Pascoe, 3,809,336.

Bailey, Denis M., to Sterling Drug Inc. 5-(3-Pyridyl)-2-furaldehyde and preparation. 3,890,335, Cl. 260-297.00R.

Bailey, William V., to United States of America, Interior. Vibrating wire meter. 3,889,525, Cl. 73-67.200.

Baily, Everett M.; Rathbone, Donald E.; and Johnson, Lynn F., to Idaho Research Foundation, Inc. Harvester boom control. 3,889,796, Cl. 198-7.000.

Bair, Howard C.; and Larsen, Richard C. Saw bar mounted sharpener for chain saws. 3,889,556, Cl. 76-25.00A.

Baker, Alfred. Nasal adapter for administering analgesic gas. 3,889,671, Cl. 128-206.000.

Bakul, Valentin Nikolaevich; Shulzhenko, Alexandr Alexandrovich; and Getman, Anatoly Fedorovich. Method of producing diamond materials. 3,890,430, Cl. 423-446.000.

Balcom Chemicals, Inc.: *See—*
Mommer, Richard Paul, 3,889,855.

Balius, Donald G. Retractable propeller guard for outboard motor or stern drive unit. 3,889,624, Cl. 115-42.000.

Ballas, Donald F.; Ku, San-Mei; and Marinace, John C., to International Business Machines Corporation. Method of electrolessly plating alloys. 3,890,455, Cl. 427-85.000.

Ballheimer, Benny, to Caterpillar Tractor Co. Connecting rod assembly. 3,889,553, Cl. 74-579.00R.

Balser, Martin, to Xonics, Inc. Acoustic wind sensor. 3,889,533, Cl. 73-189.000.

Bann, Robert Francis; Moran, William Joseph; and Roth, Philip B., to American Cyanamid Company. Cellulosic textile finish with 1,3-dimethylol-4,5-dihydroxy-2-imidazolidinone, zinc nitrate and a sequestering agent. 3,890,095, Cl. 8-185.000.

Barabino, William A., to Safety Research & Engineering Corporation. Alarm system for pneumatic tires. 3,890,595, Cl. 340-58.000.

Barber, Gerald L. Method and apparatus for transporting. 3,889,602, Cl. 104-23.0FS.

Barbour, Richard H., Jr.: *See—*
Aspinwall, Peter; and Barbour, Richard H., Jr., 3,889,564.

Barbron Corporation: *See—*
Polaner, Mardy, 3,889,649.

Barden Corporation, The: *See—*
McKee, Lewis W.; Donner, William E.; Oliva, Victor B.; Berglund, Harold R.; and Morrison, John C., 3,889,456.

Bare, John P.: *See—*
Angstadt, Howard P.; and Bare, John P., 3,890,281.

Barenyi, Bela: *See—*
Wilfert, Karl; and Barenyi, Bela, 3,889,968.

Bargen, David W., to CMX Systems. Color phase matching system for magnetic video tape recordings. 3,890,638, Cl. 358-8.000.

Barks, Ronald E., to Norton Company. Apparatus for forming solid spherical pellets. 3,890,072, Cl. 425-6.000.

Barleen, David G.; and Peters, Rex B., to Systron-Donner Corporation. Acoustic transducer. 3,890,513, Cl. 310-9.100.

Barnett, Jewell M.: *See—*
Denis, Roger; and Barnett, Jewell M., 3,889,682.

Barouh, Victor; and Glenn, Robert. Typewriter correction device employing an adhesive ribbon. 3,889,310, Cl. 15-210.00R.

Barry Wright Corporation: *See—*
Shimizu, Kazuya, 3,889,936.

Barth, Hansjochen: *See*—
Bauer, Johann; and Barth, Hansjochen, 3,890,416.

Bartner, Elliot: *See*—
Dovey, Brian H.; Bartner, Elliot; Kaplan, Sheldon; and Sarnoff, Stanley J., 3,889,673.

BASF Aktiengesellschaft: *See*—
Henkler, Herbert, 3,890,041.

BASF Wyandotte Corporation: *See*—
Boehmer, Matthew A., 3,890,238.

Battaerd, Hendrik Adriaan Jacobus: *See*—
Weiss, Donald Eric; and Battaerd, Hendrik Adriaan Jacobus, 3,890,224.

Baublys, Mikas; and Siegloch, Eugen. Transmission belt. 3,889,545, Cl. 74-231.00M.

Bauer, Benjamin B., to CBS Inc. Encoders for quadraphonic sound system. 3,890,466, Cl. 179-1.0GQ.

Bauer Bros. Co., The: *See*—
Horstman, Anton J., 3,889,890.

Bauer, Johann; and Barth, Hansjochen, to Wacker-Chemie GmbH. Method for producing a cavity or a zone of very low density in the interior of extruded profiles of foamable thermoplastics. 3,890,416, Cl. 264-45.500.

Bauer, Paul R.; and Dunwoodie, Duane E., to Wiltron Company. Telephone system testing apparatus and techniques utilizing central measuring equipment with a plurality of remote test stations. 3,890,495, Cl. 235-153.0AK.

Bauman, Joseph F.; and Elson, Arthur M., to Acme-Hamilton Manufacturing Corporation. Method for handling waste material, refuse and the like. 3,889,830, Cl. 214-152.000.

Baumgarten, Carl B., to Gomco Surgical Manufacturing Corp. Uterine aspirating curette. 3,889,657, Cl. 128-2.00B.

Bausch, Edmund: *See*—
Mutz, Gerhard; and Bausch, Edmund, 3,890,514.

Bausch & Lomb Incorporated: *See*—
Blum, Raymond T., 3,889,426.

Bayer Aktiengesellschaft: *See*—
Hofer, Wolfgang; Schliebs, Reinhard; Schmidt, Robert Rudolf; and Eue, Ludwig, 3,890,382.
Knupfer, Hans; and Schellhammer, Carl-Wolfgang, 3,890,364.
Kuhle, Engelbert; Klauke, Erich; Hamburger, Brigitte; and Scheinpflug, Hans, 3,890,386.
Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, 3,890,442.
Rees, Thomas Charles; and Sugerman, Gerald, 3,890,397.
Serini, Volker; Vernaleken, Hugo; and Cohnen, Wolfgang, 3,890,266.
Zirngiebl, Eberhard, 3,890,211.

Bayer Leichtmetallwerk- Graf Bluecher von Wahlstatt KG: *See*—
Weissmann, Gerd; and Kuebel, Edgar, 3,890,105.

Bayle, Robert Vincent, to Gemmer-France. Method of making a controlled torque connecting member. 3,889,511, Cl. 72-370.000.

Beck, James R.; and Suhr, Robert G., to Eli Lilly and Company. α,α,α-Trifluoro-2-nitro-6-[oxa(thia)zolyl]thio-p-tolunitriles. 3,890,337, Cl. 260-302.00S.

Becker, Floyd W., to Drill Systems Inc. Apparatus for pulling drill pipe. 3,889,927, Cl. 254-105.000.

Becker, Joseph J., to Firmenich S.A. Process for preparing lactones. 3,890,353, Cl. 260-343.000.

Beckman Instruments, Inc.: *See*—
Diamond, Allen M., 3,890,553.

Becton, Dickinson and Company: *See*—
Mehl, Jack Judson, 3,890,203.
Welch, Joseph T., 3,890,237.

Begin, Claude. Reversible door frame. 3,889,423, Cl. 49-504.000.

Behrens, James D.: *See*—
Ochs, David J.; and Behrens, James D., 3,889,668.

Beichel, Rudi; and O'Brien, Charles J., to Aerojet-General Corporation. Consumable detonation reaction engine and system. 3,889,462, Cl. 60-250.000.

Bell & Howell Company: *See*—
Boyer, Harold E., 3,889,801.

Bell, Rupert B.: *See*—
Combest, John F.; and Bell, Rupert B., 3,890,232.

Bell Telephone Laboratories, Incorporated: *See*—
Burtness, Richard Duane; Hess, Garry Carson; and Jensen, Bliss D., 3,890,493.
DiLorenzo, James Vincent; Niehaus, William Charles; Rode, Daniel Leon; and Schwartz, Bertram, 3,890,215.
Hachenburg, Victor, 3,890,471.
Limb, John Ormond; and Murphy, John Arthur, 3,890,462.
Pfahnl, Arnold; and Worobey, Walter, 3,890,177.
Rand, Myron Joel, 3,889,359.
Schwartz, Bertram; Spitzer, Stuart Marshall; and Weigle, Gregory Dyett, 3,890,169.

Bellina, Russell F., to du Pont de Nemours, E. I., and Company. 1,1-Dimethyl-2-thio-3-(4-alkyl-piperazino)-thocarbonyl ureas. 3,890,322, Cl. 260-268.00C.

Bellmann, Bernhard: *See*—
Stoferle, Theodor; and Bellmann, Bernhard, 3,889,520.

Beloit Corporation: *See*—
Justus, Edgar J.; and Roerig, Arnold J., 3,889,334.
Melead, James J., 3,889,892.

Belsley, Kenneth I., to United States of America, Navy. Arming system. 3,889,598, Cl. 102-16.000.

Bendayan, Jacques, to Les Cables de Lyon. Flexible circular waveguide utilizing helical windings. 3,890,583, Cl. 333-95.00A.

Bender, Horst, to WIBAU (Westdeutsche Industrie-und Strassenbaumaschinen-Gesellschaft m.b.H.). Reciprocating valve for double piston concrete pump. 3,889,713, Cl. 137-625.480.

Bender, Hugo, to Hoechst Aktiengesellschaft. Welded polyester bags. 3,889,870, Cl. 229-55.000.

Bender, Richard E.: *See*—
Schaefer, William H.; and Bender, Richard E., 3,889,951.

Bendix Corporation, The: *See*—
Rachel, Todd L., 3,889,647.
Tawfik, David A., 3,890,575.

Benezra, Leo L., to Diamond Shamrock Corporation. Hydrogenation process with unsupported Group VIII metal hydroxide catalysts. 3,890,329, Cl. 260-293.520.

Bennett, Milton C., to J. I. Case Company. Piston rod floating wiper. 3,889,958, Cl. 277-24.000.

Bennett, Robert A. Container closure opening means. 3,889,842, Cl. 220-253.000.

Benzoni, Rene Pierre: *See*—
Fieuzal, Jean Henri; Bourgine, Louis; and Benzoni, Rene Pierre, 3,889,549.

Berens, Jack: *See*—
Vogelman, Joseph H.; Spiegelman, Stanley D.; and Berens, Jack, 3,890,461.

Berg, Robert A., to Consolidated Packaging Corporation. Display carton. 3,889,867, Cl. 229-28.00R.

Berg, Ronald; Hjermstad, Hans Petter; and Neefjes, Gerard Albert, to Institutt for Atomenergi. Procedure for increasing the chemisorption capacity of carbon with regard to gases. 3,890,245, Cl. 252-447.000.

Berger, Joel G., to du Pont de Nemours, E. I., and Company. Trans-1,2,3,4,4a,8,9,14a-octahydropyrido[r',3':2,3]indolo[1,7-ab][1]benzazepine. 3,890,327, Cl. 260-293.550.

Bergeron, Duncan G.; and Leach, Ray E. Seedling tree growing apparatus. 3,889,416, Cl. 47-34.130.

Bergeron, John A., to General Electric Company. Combined sampling and bacteriological culturing device. 3,890,202, Cl. 195-127.000.

Berglund, Harold R.: *See*—
McKee, Lewis W.; Donner, William E.; Oliva, Victor B.; Berglund, Harold R.; and Morrison, John C., 3,889,456.

Berkey Photo, Inc.: *See*—
Grey, David S., 3,890,036.

Berkman, Joseph L. Rack. 3,889,817, Cl. 211-163.000.

Berleyoung, Walter J.: *See*—
Brakebill, Harold G.; Lewis, Jay L.; and Berleyoung, Walter J., 3,889,335.

Berling, David Thomas; and Chaney, John William, to Cincinnati Milacron Inc. Hermetic sealing structure for electronic keyboard apparatus. 3,890,480, Cl. 200-302.000.

Bernasconi, Raymond: *See*—
Schenker, Karl; and Bernasconi, Raymond, 3,890,441.

Berninger, Walter H., to General Electric Company. Fast response time image tube camera. 3,890,506, Cl. 250-370.000.

Berns, Heinz-Josef: *See*—
Gehrmann, Klaus; Ohorodnik, Alexander; Dettmeier, Odo; and Berns, Heinz-Josef, 3,890,399.

Bernstein, Herbert J.; and Arnold, William J. Photographic printing apparatus. 3,890,045, Cl. 355-73.000.

BernzOmatic Corporation: *See*—
Avant, Richard H.; and Webster, Peter R., 3,889,835.

Bertino, Lorenzo: *See*—
Garberi, Sergio; and Bertino, Lorenzo, 3,889,795.

Bethlehem Steel Corporation: *See*—
Kranenberg, Helmut; and Sawitz, Michael, 3,889,507.

Betz Laboratories, Inc.: *See*—
Lieberman, Hillel; and Ziegler, Robert J., 3,890,295.

Beun, Mattijs; and Reijnierse, Pieter, to U.S. Philips Corporation. Method of and device for determining significant points of characters. 3,890,596, Cl. 340-146.3MA.

Beyer, Horst; and Buran, Ulrich, to Goetzewerke-Friedrich Goetze AG. Welding powder for producing wear-resistant layers by build-up welding. 3,890,137, Cl. 75-.5BB.

Beyer, John P., to Communications Satellite Corporation. Radio frequency polarimeter. 3,890,571, Cl. 324-95.000.

Bhopale, Arvind M.: *See*—
Stuart, Richard L.; Bhopale, Arvind M.; and Treynor, Paul E., 3,890,581.

Bhutani, Sudhir K.: *See*—
Wojtowicz, John A.; and Bhutani, Sudhir K., 3,890,338.

Bidlack, Harvey D.: *See*—
Filter, Harold E.; Bidlack, Harvey D.; and Stevens, Don L., 3,890,172.
Filter, Harold E.; and Bidlack, Harvey D., 3,890,173.

Biek, Paul Albert, to Dresser Industries, Inc. Socket retainer for rotatable power tool. 3,890,051, Cl. 403-20.000.

Bierhenke, Hartwig, to Siemens Aktiengesellschaft. Process for the production of high value ohmic load resistors and mos transistors having a low starting voltage. 3,889,358, Cl. 29-571.000.

Binder Magnete GmbH: *See*—
Mutz, Gerhard; and Bausch, Edmund, 3,890,514.

Bingham, Alex John; Haylock, John Christopher; and Lofquist, Robert Alden, to Allied Chemical Corporation. Production of polycaproamide fiber. 3,890,286, Cl. 260-78.00L.

Binks, Chester J.; and Moser, Joseph M., to Restaurant Technology, Inc. Steam injector spatula. 3,889,582, Cl. 99-450.000.

Bio-Analytical Labs, Inc.: *See*—
Fiore, John M., 3,889,661.

Bishop, Jerry B.: *See—*
Owens, Frederick J.; Bishop, Jerry B.; and Fidelman, David, 3,889,387.

Bitco, Inc.: *See—*
Mosely, Donald E., 3,889,825.

Black Clawson Company, The: *See—*
Couture, J. Walter, 3,889,885.
Maxey, Carl W., 3,890,509.

Black, James A. Stencil screen coating machine. 3,889,629, Cl. 118-6.000.

Blaimschein, Gottfried: *See—*
Kralowetz, Bruno; and Blaimschein, Gottfried, 3,889,514.

Blanchenot, John P., to Hi-G Incorporated. Theft proof terminator system for cable TV outlets. 3,890,028, Cl. 339-85.000.

Blaschke, Franz; Gardziella, Arno; and Schade, Gerhard, to Dynamit Nobel AG. Method of bonding using a polyester hot-melt adhesive. 3,890,186, Cl. 156-332.000.

Bleicher, Manfred: *See—*
Wanner, Karl; Karl, Hubertus; Hansel, Gernot; Bleicher, Manfred; and Schmid, Wolfgang, 3,889,491.

Blitzer, Sidney M., to Ethyl Corporation. SO_2 removal from gases. 3,890,431, Cl. 423-575.000.

Blohm, Thomas R.: *See—*
Grisar, J. Martin; Claxton, George P.; and Blohm, Thomas R., 3,890,445.

Blomstrom, Gary D.; Piepho, Donald A.; Randour, Victor; and York, Lyle E., to Caterpillar Tractor Co. Suspension arrangement for a track-type vehicle. 3,889,769, Cl. 180-9.500.

Blue, Donald F., to Caterpillar Tractor Co. Machine slide assembly. 3,890,017, Cl. 308-3.00A.

Bluem, Gary R. Fluid pressure testing apparatus. 3,889,530, Cl. 73-146.800.

Blum, Raymond T., to Bausch & Lomb Incorporated. Optical lens generating machine having an air rotatable spherical bearing workpiece holder. 3,889,426, Cl. 51-55.000.

Blumer, Larry D., to General Motors Corporation. Power booster and master cylinder assembly. 3,889,468, Cl. 60-548.000.

Bocquillon, Francois; and Massiera, Roger, to Thomson-CSF. Grouping of electro-acoustic transducers particularly for use in underwater detection systems. 3,890,591, Cl. 340-6.00R.

Bode, Charles H., Jr.; Craig, Carlton E.; Friend, Donald L.; Lazzaretti, Louis G.; and Wagner, George J., Jr., to United States Steel Corporation. Extractor for guide rolls. 3,889,344, Cl. 29-252.000.

Boden, Karl; and Scheffer, Dietrich, to Padana AG. Magnetic bearings. 3,890,019, Cl. 308-10.000.

Boehmer, Matthew A., to BASF Wyandotte Corporation. Water solubility of polyoxyalkylene polymers. 3,890,238, Cl. 252-1.000.

Boehringer, Wilfred E., to McDonnell Douglas Corporation. Thermal fuse mechanical disconnect. 3,889,789, Cl. 192-82.00T.

Boehringer, Wilfred E.; Little, Jane; Rothi, Robert D.; and Westlund, Charles G., to McDonnell Douglas Corporation. Reciprocating transfer pump. 3,890,064, Cl. 417-237.000.

Boeing Company, The: *See—*
Hilby, Noel Evan, 3,889,903.

Bogdanov, Georgy Yakovlevich; Deminsky, Jury Andreevich; Zax, Mikhail Isaakovich; and Tsygankov, Jury Viktorovich. Device for setting up arc current in pulsed arc welding. 3,890,557, Cl. 321-16.000.

Boggs, Roger L.; and Reinsma, Harold L., to Caterpillar Tractor Co. Impact absorbing noise suppression device. 3,889,550, Cl. 74-443.000.

Bohme, Reinhard D.; and Ilagan, Perlita A., to Daubert Chemical Company. Adhesive compositions and tapes. 3,890,292, Cl. 260-80.760.

Boileau, Sylvie: *See—*
Lehn, Jean-Marie; Schue, Francois; Boileau, Sylvie; Kaempf, Bernd; Cau, Alain Andre; Moinard, Jean Robert; and Raynal, Serge Fernand, 3,890,278.

Boler, Leonard J., to Cherne Industrial, Inc. Liquid cooling assemblies. 3,890,412, Cl. 261-90.000.

Bolon, Donald A., to General Electric Company. Method for removing photoresist from substrate. 3,890,176, Cl. 156-2.000.

Bonner, Francis J., Sr., to Bonner, Marion K. Therapeutic stump treating air sac prosthesis. 3,889,301, Cl. 3-20.000.

Bonner, Marion K.: *See—*
Bonner, Francis J., Sr., 3,889,301.

Borg-Warner Corporation: *See—*
Davidson, Robert R., 3,890,068.
Wiese, Winfred J., 3,889,960.

Borsten, Herman: *See—*
De Boer, Jan J.; and Borsten, Herman, 3,889,328.

Bosse, Robert W., to Groov-Pin Corporation. Method of mounting locking, self-tapping threaded stud insert assembly. 3,889,352, Cl. 29-432.000.

Boszak, Ronald J.: *See—*
Schlesinger, Sheldon Irwin; Boszak, Ronald J.; Shuppert, Laurence Verlan; and Cowling, Richard James, 3,890,149.

Bourdo, John Lorin, to Automated Construction Industries, Inc. Transfer mechanism for structural members. 3,890,075, Cl. 425-88.000.

Bourgine, Louis: *See—*
Fieuzal, Jean Henri; Bourgine, Louis; and Benzoni, Rene Pierre, 3,889,549.

Bovensiepen, Hans-Friedrich, to Peter Wolters. Double-disc flat-lapping or honing machine including a free-wheeling drive connection. 3,890,114, Cl. 51-118.000.

Bowen, Francis J.: *See—*
Stevens, Douglas; Forberg, Helge O.; Jennings, Larry D.; Stephens, Frank M., Jr.; Bowen, Francis J.; Thompson, David L.; and Copenhaver, Julian V., Jr., 3,890,425.
Stevens, Douglas; Forberg, Helge O.; Jennings, Larry D.; Stephens, Frank M., Jr.; and Bowen, Francis J., 3,890,426.

Bowers, Gerald M.; and Cay, Norman S., to Unicorp Incorporated. Apparatus for loading and unloading susceptors from reactor. 3,889,821, Cl. 214-1.0BB.

Boyd, John F.: *See—*
Dowling, Donald J.; Boyd, John F.; and Fuchs, James A., 3,890,502.

Boyd, Roy W., Jr., to Rosen, Irving; and Rosen, Gerald J. Apparatus for removing a sternum from a chicken carcass. 3,889,317, Cl. 17-11.000.

Boyer, Harold E., to Bell & Howell Company Vacuum conveyor belt with air bearing. 3,889,801, Cl. 198-184.000.

Bozec, Christian: *See—*
Gandon, Louis; Bozec, Christian; and Lenoble, Philippe, 3,890,243.

BP Chemicals International Limited: *See—*
Dobson, Kenneth Rowland, 3,890,375.

Bradley, Chester D., to A. H. Emery Company, The. Rectangular hydraulic load cell. 3,889,529, Cl. 73-141.00R.

Brakebill, Harold G.; Lewis, Jay L.; and Berleyoung, Walter J., to Robertshaw Controls Company. Pressure regulator construction and method of making the same. 3,889,335, Cl. 29-157.10R.

Brand, Robert. Gas pedal biasing device. 3,889,938, Cl. 267-153.000.

Brandis, Curt; and Schatz, Oskar, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Worm throttle means. 3,889,932, Cl. 259-191.000.

Brandt, Jean; Giddey, Claude; and Bunter, Guy, to Etablissements V.Q. Petersen & Cie. Method of reducing the aflatoxin contact of oilseed meal products. 3,890,452, Cl. 426-321.000.

Brash, Douglas J., to General Mills, Inc. Wagon wheel package loader. 3,889,445, Cl. 53-26.000.

Brattgard, Sven-Olof. Chair provided with wheels. 3,889,963, Cl. 280-36.00B.

Bray, William W., Sr. Ducted grease vapor exhaust system. 3,889,581, Cl. 98-115.00K.

Bredt, Elmer S. Landing gear for semi-trailer. 3,889,972, Cl. 280-150.500.

Breelle, Yves; Grehier, Alain; and Paty, Marcel, to Institut Francais du Petrole, des Carburants et Lubrifiants. Device for the sealing of a block formed of a pile of plates, such that of fuel cell, while maintaining free passageways between these plates. 3,890,076, Cl. 425-110.000.

Breido, Isaak Yankelevich: *See—*
Kozlov, Vladimir Dmitrievich; and Breido, Isaak Yankelevich, 3,890,050.

Bresser, Robert E.: *See—*
Kugele, Thomas G.; and Bresser, Robert E., 3,890,277.

Brewster, John L., to Hewlett Packard Company. Stimulated emission light source pumped by electron beam of field emission initiated vacuum arc. 3,890,503, Cl. 250-321.000.

Bricker, Norman C., to Raymond Lee Organization, Inc., The. Gear clutches with selector valve. 3,889,790, Cl. 192-85.0AT.

Bridgestone Tire Company Limited: *See—*
Onnishi, Akira; Yukuta, Toshio; Fujio, Ryota; Ishida, Yozo; Kambara, Shu; and Kojima, Minoru, 3,890,284.
Yukuta, Toshio; Ohashi, Takashi; and Oguri, Yoshiko, 3,890,293.

Briggs, Paul Clayton, Jr.; and Muschiatti, Lawrence Carl, to du Pont de Nemours, E. I., and Company. Novel adhesive compositions. 3,890,407, Cl. 260-878.00R.

Bright, William L. Safety lock for enclosures. 3,889,993, Cl. 292-251.000.

Brink, Robert V.: *See—*
Daly, Richard H.; Brink, Robert V.; and Andersen, Kare, 3,890,082.

Bristol-Myers Company: *See—*
Sapino, Chester, Jr.; and Ruggeri, Mariano Vecchio, 3,890,310.

British Insulated Callender's Cables Limited: *See—*
Littler, Joseph; Taylor, Dennis Joseph; and Campbell, Kenneth James, 3,889,788.

Broadbent, Douglas; Burrows, Brian Frederick; Carter, Stephen Barnaby; and Hemming, Harold George, to Imperial Chemical Industries Limited. Antibiotic substance. 3,890,435, Cl. 424-115.000.

Brock, Gordon L. Electronic module and method of fabricating same. 3,889,365, Cl. 29-627.000.

Brooks, Robert C., to Armco Steel Corporation. Gate valve and seal. 3,889,925, Cl. 251-327.000.

Brost, Julien H. Check valve with elastomeric valve element. 3,889,710, Cl. 137-512.150.

Brown, Boveri & Cie AG: *See—*
Jurgens, Heinz; and Ostendorf, Heinrich, 3,889,798.

Brown, Bruce B., to United States of America, Army. Gage for measuring the circumferential expansion of internally pressurized tubes. 3,889,381, Cl. 33-179.000.

Brown, Charles M., III. Diode array. 3,890,161, Cl. 136-212.000.

Brown, John Graham; and Payne, Henry Arthur Sheldon, to Murphy Chemical Ltd. Certain diguanidino compounds used as fungicides. 3,890,446, Cl. 424-326.000.

Bruckner, Arnold D.; and Johnson, Marlyn D., to Liberty Carton Co. Mail handling container. 3,889,868, Cl. 229-34.00R.

Bruel, Alain. Grape and juice recovering device to be fitted to a grape-gathering machine. 3,889,454, Cl. 56-330.000.

Brumlik, George C., to Ingrip Fasteners Inc. Multi-element self-gripping device. 3,889,322, Cl. 24-204.000.

Brunner, Rolf H.; and Lester, William C., to International Business Machines Corporation. Variable incidence drive for deposition tooling. 3,889,632, Cl. 118-49.100.

Brunnett, Carl J.; Gibson, Jeremy H.; Mog, Walter F.; and Smith, Richard S., to Picker Corporation. High speed color printer for scintillation scanner. 3,890,355, Cl. 250-366.000.

Brunt, Geoffrey Albert Kenyon: *See—*
Williams, Malcolm; Brunt, Geoffrey Albert Kenyon; and Jones, Christopher Robin, 3,889,648.

Bryant, Walter Kenneth, to Lucas Electrical Company Limited, The. Bulbholder assemblies for lamp units. 3,890,031, Cl. 339-119.00L.

Buachet, Pierre: *See—*
Pruvot, Francois C.; Maistrelli, Roger; and Buachet, Pierre, 3,890,360.

Buc, John L. Pencil sharpener. 3,889,730, Cl. 144-28.500.

Buchanan, John Brown; Stephens, Stanley William; and Grenfell, Julian Pascoe, to Badalex Limited. Apparatus for assembling components. 3,889,336, Cl. 29-203.00P.

Buchel, Karl Heinz: *See—*
Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, 3,890,442.

Buchi, George H.; and Wuest, Hans, to Firmenich S.A. Process for preparing 2,6,6-trimethyl 1-alkoxycarbonyl-2,4-cyclohexadienes. 3,890,370, Cl. 260-468.00L.

Buchner, Heinrich: *See—*
Thomas, Hans Peter; and Buchner, Heinrich, 3,889,393.

Buck, Homer G. Electroerosive process for manufacturing rotary dies. 3,890,481, Cl. 219-69.00M.

Buckley, James H.: *See—*
Jackson, Ira J.; O'Connor, Thomas F.; and Buckley, James H., 3,889,589.

Buenger, George L., to Rycom Instruments. Digital data totalizer system. 3,890,490, Cl. 235-92.0TF.

Buford, Wesley E.: *See—*
Juarez, Robert N.; Juarez, Jean; and Buford, Wesley E., 3,889,590.

Buhayar, Eric S.; and Gerstenkorn, Gordon F., to Scott Paper Company. Apparatus for resurfacing the cylindrical face of large drier drums. 3,889,424, Cl. 51-49.000.

Bull, David W.; and Miller, Gerald K., to Nartron Corporation. Flow sensor and system. 3,889,535, Cl. 73-208.000.

Bunter, Guy: *See—*
Brandt, Jean; Giddey, Claude; and Bunter, Guy, 3,890,452.

Buran, Ulrich: *See—*
Beyer, Horst; and Buran, Ulrich, 3,890,137.

Burkhardt, Daniel J., to Aluminum Company of America. Capping spindle for securing closures on containers. 3,889,451, Cl. 53-342.000.

Burns, Robert V.; and Hamilton, Richard J., to GTE Automatic Electric Laboratories Incorporated. Circuit arrangement for ground start coin operated telephones. 3,890,468, Cl. 179-6.500.

Burroughs Corporation: *See—*
Goetzinger, Gunther R.; and Di Veto, Hilliard R., 3,890,644.

Burroughs Wellcome Co.: *See—*
Wood, Hamish Christopher Swan; Stuart, Alexander; Curran, Adrian Charles Ward; and Al-hassan, Saieba, 3,890,387.

Burrows, Brian Frederick: *See—*
Broadbent, Douglas; Burrows, Brian Frederick; Carter, Stephen Barnaby; and Hemming, Harold George, 3,890,435.

Burrows, Kenneth; and Hiscutt, Robert, to Triplex Safety Glass Company Limited. Reactive sputtering apparatus and cathode elements therefor. 3,890,217, Cl. 204-298.000.

Burtness, Richard Duane; Hess, Garry Carson; and Jensen, Bliss D., to Bell Telephone Laboratories, Incorporated. Circuitry for detecting faults in duplicate controllers. 3,890,493, Cl. 235-153.0AE.

Busch, Francis R., to General Electric Company. Gas conditioning and analyzing system. 3,890,100, Cl. 23-232.00E.

Buschmann, Karl: *See—*
Nicolay, Karl; Buschmann, Karl; and Madueno, Jesus Perez, 3,889,614.

Buttimore, David, to May & Baker Limited. Method for controlling the growth of weeds in a cotton growing area with 3,4,5-trisubstituted isothiazoles. 3,890,131, Cl. 71-90.000.

Butts, Charles E.; and Gray, Harry C., to United States of America, Energy Research and Development Administration. Suspension scheme for fuel pin. 3,890,197, Cl. 176-78.000.

Butz, Klaus S.: *See—*
Simon, Alvin L.; and Butz, Klaus S., 3,889,839.

C.A.V. Limited: *See—*
Marshall, Leonard, 3,889,478.
Williams, Malcolm; Brunt, Geoffrey Albert Kenyon; and Jones, Christopher Robin, 3,889,648.

C. Hager & Sons Hinge Manufacturing Company: *See—*
Peterson, Francis C., 3,890,608.

Cable & Wireless Limited of Smale House: *See—*
Roche, Francis G., 3,890,600.

Cady, Paxton, to Bactomatic Inc. Multi-chamber impedance measuring module-cap combination. 3,890,201, Cl. 195-127.000.

Cahen, Olivier, to Thomson-CSF. High-precision digital-to-analog converters. 3,890,610, Cl. 340-347.0CC.

Cahoy, Roger Paul, to Gulf Research & Development Company. 3,5-Tert. butyl-4-(2,4-dichlorophenylcarbamyloxy) benzylidenemalonitrile. 3,890,367, Cl. 260-465.00D.

Calgon Corporation: *See—*
Urbanic, John Emery, 3,889,691.

Campbell, Kenneth James: *See—*
Littler, Joseph; Taylor, Dennis Joseph; and Campbell, Kenneth James, 3,889,788.

Campbell, Roy L.: *See—*
Loveland, Steven R.; and Campbell, Roy L., 3,889,670.

Campbell, Thomas R. Retriever. 3,889,996, Cl. 294-19.00A.

Canada, Her Majesty the Queen in right of, as represented by the Secretary of State: *See—*
O'Donnell, Leopold Henry; Forget, Robert; and Hasrouni, Youssef, 3,890,639.

Canon Inc.: *See—*
Nagashima, Shinichiro; and Tsuchiya, Kaichi, 3,890,146.

Canon Kabushiki Kaisha: *See—*
Ichikawa, Junji, 3,890,038.
Izumi, Hideo; and Ichiyanagi, Toshikazu, 3,890,550.

Cantaluppi, Angelo: *See—*
Porta, Paolo Della; Ferrario, Bruno; Cantaluppi, Angelo; Montalenti, Paolo; and Giorgi, Fiziano A., 3,890,104.

Cantarano, Marcus. Electrographic devices for the development composition and transfer of particles images. 3,890,039, Cl. 355-3.00R.

Cantarano, Marcus. Electrographic devices for the non-electrostatic duplication of originals provided with a conductivity pattern formed from indicia and blank areas. 3,890,621, Cl. 346-74.0ES.

Canter, James A.; and Smith, Robert, to General Motors Corporation. Appliance cabinet with actuated door switch. 3,890,476, Cl. 200-61.620.

Carando Machine Works: *See—*
McCoy, Thomas A., 3,889,427.

Carborundum Company, The: *See—*
Economy, James; Frechette, Francis J.; Lin, Ruey Y.; and Wohrer, Luis C., 3,890,262.
Schoeck, Vincent E., 3,890,125.

Card, Joseph Lewis: *See—*
Passons, William Erby; and Card, Joseph Lewis, 3,889,616.

Cariani, Montero: *See—*
Persson, Henry, 3,889,308.

Carl Still, Firma: *See—*
Wunsch, Heinz, 3,890,206.

Carlin, William W., to PPG Industries, Inc. Recovery of technetium from nuclear fuel wastes. 3,890,244, Cl. 252-301.10R.

Carlson, Elmer A., to International Telephone and Telegraph Corporation. Ignition system and components thereof. 3,890,579, Cl. 331-111.000.

Carnahan, Thomas G.: *See—*
Heinen, Harold J.; Carnahan, Thomas G.; and Eisele, Judith A., 3,890,007.

Carrigan, Tracy, to FMC Corporation. Wheel mounting apparatus. 3,889,542, Cl. 73-460.000.

Cartabbia, Giovanni. Machine for continuous coupling of fabrics. 3,890,193, Cl. 156-582.000.

Carter, Leroy C.: *See—*
Smith, Robert E.; and Carter, Leroy C., 3,890,021.

Carter, Stephen Barnaby: *See—*
Broadbent, Douglas; Burrows, Brian Frederick; Carter, Stephen Barnaby; and Hemming, Harold George, 3,890,435.

Casella, Daniel C.: *See—*
Haugsjaa, Paul O.; and Casella, Daniel C., 3,890,511.

Casella, Frank P. Clock housing and decorative means therefor. 3,889,806, Cl. 206-223.000.

Casey, Donald James; and Epstein, Martin, to American Cyanamid Company. Process for post-polymerizing polyglycolic acid. 3,890,283, Cl. 260-78.30R.

Casey, John W.; Easley, Sydney E.; Gough, Melvin O.; and Jones, William F., to General Motors Corporation. Lubricated spline coupling. 3,889,489, Cl. 64-9.00R.

Cashew Company, Ltd.: *See—*
Mizuno, Nobuhiko; and Wakai, Hideo, 3,889,583.

Casio Computer Co. Ltd.: *See—*
Kashio, Toshio, 3,889,458.

Castela, Andre; and Joubert, Philippe, to Institut Francais du Petrole, des Carburants et Lubrifiants. Device for maintaining a working fluid under a predetermined pressure. 3,889,466, Cl. 60-533.000.

Castle, Trevor William. Electronic amusement machine. 3,889,956, Cl. 273-138.00A.

Caterpillar Tractor Co.: *See—*
Ballheimer, Benny, 3,889,553.
Blomstrom, Gary D.; Piepho, Donald A.; Randour, Victor; and York, Lyle E., 3,889,769.
Blue, Donald F., 3,890,017.
Boggs, Roger L.; and Reinsma, Harold L., 3,889,550.
Cryder, John R.; and Hall, Lowell R., 3,889,469.
Eftefield, Larry G., 3,889,404.

Cathelin, Pierre-Rene; and Konrad, Hermann-Heinz, to Hoechst Aktiengesellschaft. Level dyeing of wool polyimine or polyamine and sulfonated phenylene amino-chlorotriazine treated. 3,890,091, Cl. 8-17.000.

Cattaneo, Sergio, to Honeywell Information Systems Italia. Mosaic printing head. 3,889,793, Cl. 197-1.00R.

Cau, Alain Andre: *See—*
Lehn, Jean-Marie; Schue, Francois; Boileau, Sylvie; Kaempf, Bernd; Cau, Alain Andre; Moinard, Jean Robert; and Raynal, Serge Fernand, 3,890,278.

Caveney, Jack E., to Panduit Corporation. Wireway system and retaining finger for use therein. 3,890,459, Cl. 174-101.000.

Cay, Norman S.: *See—*
Bowers, Gerald M.; and Cay, Norman S., 3,889,821.

Cayen, Mitchell N.; and Dvornik, Dushan M., to American Home Products Corporation. Compositions and methods for reducing blood cholesterol. 3,890,438, Cl. 424-240.000.

CBS Inc.: *See—*
Bauer, Benjamin B., 3,890,466.

Celada, Juan; MacKay, Patrick W.; and de la Pena, Ramon, to Fierro Esponja, S.A. Method and apparatus for reducing particulate metal ores to sponge iron. 3,889,864, Cl. 266-24.000.

Celada, Juan; and MacKay, Patrick W., to Fierro Esponja, S.A. Method for gaseous reduction of metal ores. 3,890,142, Cl. 75-91.000.

Celestron Pacific: *See—*
Johnson, Thomas J., 3,889,431.

Celio, Tino: *See—*
Abbondio, Antonio; and Celio, Tino, 3,890,048.

Centre National pour l'Exploitation des Oceans: *See—*
Gauthier, Michel; Tessier, Marcel; Fleruy, Daniel; and Jegousse, Michel, 3,889,403.

Certain-teed Products Corporation: *See—*
Davis, Frank H.; Wolfe, Homer O., Jr.; and Clapp, Billy D., 3,889,444.

Ceske vysoke uceni technicke: *See—*
Nemec, Josef, 3,889,519.

Chabardes, Pierre; Julia, Marc; and Menet, Albert, to Rhone-Poulenc S.A. 2-Methyl-butadienyl-sulphones. 3,890,393, Cl. 260-607.00R.

Chafer, Henry James; and Graham, Stuart, to Joseph Lucas (Industries) Limited. Spark discharge plugs. 3,890,519, Cl. 313-130.000.

Chamia, Michel, to Allmanna Svenska Elektriska Aktiebolaget. Means for limiting the dynamic overreach in, for example, an impedance relay. 3,890,544, Cl. 317-27.00R.

Champion International Corporation: *See—*
Clough, Gary Lee, 3,889,873.

Chandler, Robert F., Jr., to General Electric Company. Shot volume and cushion point control for injection molding apparatus. 3,889,849, Cl. 222-63.000.

Chandra, Grish, to Dow Corning Limited. Complexes containing sulphur. 3,890,359, Cl. 260-429.00R.

Chaney, John William: *See—*
Berling, David Thomas; and Chaney, John William, 3,890,480.

Chanson, Olivier: *See—*
Marti, Raymond; and Chanson, Olivier, 3,889,461.

Chant, John Bernard, to Vessa Limited. Drive disconnect for motorized wheelchair. 3,889,773, Cl. 180-65.00R.

Chapman, Walter H.; and Eichelmann, John F., Jr., to El Paso Southern Company. Air and water pollution control. 3,890,207, Cl. 203-11.000.

Charles, Joel M.: *See—*
David, Pierre Y.; Charles, Joel M.; and Toscano, Robert Julien Antoine, 3,889,928.

Charlton, Paul, to Norprint Limited. Impregnated roller. 3,889,597, Cl. 101-367.000.

Chatterjee, Pronoy Kumar; and Schwenker, Robert Frederick, Jr., to Personal Products Company. Cellulose graft copolymer containing non-ionic and ionic polymer moieties as absorbent media in absorbent dressings. 3,889,678, Cl. 128-284.000.

Chaya, John Edward: *See—*
Ricciardi, Michael Anthony; Smudin, David J.; Wagner, Richard D.; Pcolinsky, Michael; and Chaya, John Edward, 3,890,414.

Check, Frank T., Jr.: *See—*
Lupkas, Raymond R.; Freeman, Gerald C.; and Check, Frank T., Jr., 3,889,592.

Chemed Corporation: *See—*
Hwa, Chih Ming; Cuisia, Dionisio Guerrero; and Gray, John Allen, 3,890,228.

Chemie Linz Aktiengesellschaft: *See—*
Obendorf, Werner; Lindner, Irmgard; Schwarzinger, Ernst; and Krieger, Josef, 3,890,318.

Chen, Ting P., to Texaco Inc. Method for preparing N-substituted morpholines. 3,890,315, Cl. 260-247.000.

Cherne Industrial, Inc.: *See—*
Boler, Leonard J., 3,890,412.

Cheshir, Keith; and Farr, Peter, to Dowty Mining Equipment Limited. Hose coupling. 3,889,986, Cl. 285-305.000.

Chester, Francis B. Aerobic/anaerobic composting device and method of composting. 3,890,129, Cl. 71-9.000.

Chetter, John, to United Kingdom Atomic Energy Authority. Nuclear reactor fuel element assembly spacer grid and method of making. 3,890,196, Cl. 176-78.000.

Chevron Research Company: *See—*
Hutchison, Stanley O., 3,889,749.
Upadhyaya, Janardan D., 3,890,280.
White, Robert J., 3,890,432.

Chicago Bridge & Iron Company: *See—*
Tam, William A., 3,889,477.

Chicago Rawhide Manufacturing Company: *See—*
Daly, Richard H.; Brink, Robert V.; and Andersen, Kare, 3,890,082.

Child, Edward T; and Robin, Allen M., to Texaco Inc. Production of methane. 3,890,113, Cl. 48-197.00R.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara RT: *See—*
Schawartz, Jozsef, 3,890,379.

Chivers, James R.; and Pound, William C., to Hoover Company, The. Steam iron water valve and manual operating mechanism therefor. 3,889,406, Cl. 38-77.830.

Chromalloy Electronics Div. Chromalloy American Corp.: *See—*
Rush, David H., 3,890,497.

Chronister, Clyde H.; Grieger, Cecil C.; and Oliver, Alton D., to Chronister Development, Inc. Dual ball launch valve. 3,889,708, Cl. 137-268.000.

Chronister Development, Inc.: *See—*
Chronister, Clyde H.; Grieger, Cecil C.; and Oliver, Alton D., 3,889,708.

Chuan Chang Enterprise Corporation: *See—*
Lin, Chun-Cheng, 3,889,995.

Chugai Denkikogyo Kabushiki Kaisha: *See—*
Shibata, Akira, 3,889,366.

Ciba-Geigy AG: *See—*
Jager, Horst, 3,890,376.
Weber, Kurt; and Schlapfer, Hans, 3,890,305.

Ciba-Geigy Corporation: *See—*
Finch, Neville; and Vlattas, Isidoros, 3,890,369.
Jeger, Oskar; Wolf, Hans; and Zink, Markus, 3,890,395.
Schenker, Karl; and Bernasconi, Raymond, 3,890,441.
Weber, Christain; Puck, Alfred; and Voirol, Peter, 3,889,921.
Werner, Lincoln Harvey, 3,890,330.
Wieland, Peter, 3,890,303.
Zust, Armin; Schindler, Walter, deceased; and Gysin, Leonhard, executor, 3,890,439.

Cilento, Constabile A. Mixing syringe. 3,889,674, Cl. 128-218.00M.

Cincinnati Milacron Chemicals Inc.: *See—*
Kugele, Thomas G.; and Bresser, Robert E., 3,890,277.
Stapfer, Christian H., 3,890,276.

Cincinnati Milacron-Heald Corporation: *See—*
Robillard, Edward G., 3,890,115.

Cincinnati Milacron Inc.: *See—*
Berling, David Thomas; and Chaney, John William, 3,890,480.

Clamon, Robert Dale, to Dresser Industries, Inc. Rotary rock bit with wiper pad lubrication system. 3,890,018, Cl. 308-8.200.

Clancy, David, to Colgate-Palmolive Company. Web feeding and folding apparatus. 3,889,941, Cl. 270-69.000.

Clapp, Billy D.: *See—*
Davis, Frank H.; Wolfe, Homer O., Jr.; and Clapp, Billy D., 3,889,444.

Clark Equipment Company: *See—*
Jarvis, Lactance A.; and Nimtz, Ronald L., 3,889,618.
Jesswein, Ronald M., 3,889,976.

Clark, Gary T.: *See—*
Straley, James M.; and Clark, Gary T., 3,890,307.

Claxton, George P.: *See—*
Grisar, J. Martin; Claxton, George P.; and Blohm, Thomas R., 3,890,445.

Cleaver, Brian William; and Rees, Alfred, to Joseph Lucas (Electrical) Limited. Method of supporting distributor blank for machining. 3,889,356, Cl. 29-559.000.

Clement, Vernon D. Cantilevered drapery processing machine. 3,889,857, Cl. 223-32.000.

Clerk, Robert Cecil. Axial piston rotary barrel type hydraulic pumps or motors. 3,889,578, Cl. 91-499.000.

Cline, Lee R. Aid for making a baseball batters' box. 3,889,379, Cl. 33-174.00G.

Close, Albert R., to American Safety Equipment Corporation. Free pull retractor. 3,890,003, Cl. 297-388.000.

Clough, Gary Lee, to Champion International Corporation. Money machine envelope. 3,889,873, Cl. 229-72.000.

Cloyd, Harold S., to Nosco Plastics, Inc. Tilt indicator for shipping containers and the like. 3,889,627, Cl. 116-114.0AH.

Cluett, Peabody & Co., Inc.: *See—*
Hughes, Francis H.; and Crawford, Douglas J., 3,889,612.

CMX Systems: *See—*
Bargen, David W., 3,890,638.

Coderre, Curtis M., to Northrop Corporation. Hydraulic system reservoir having separate oil and air-oil chambers. 3,889,705, Cl. 137-171.000.

Coen Company, Inc.: *See—*
Voorheis, Temple S.; and Vosper, Ralph R., 3,890,084.

Coetzee, Josef Erasmus, to AE&CI Limited. Manufacture of safety fuse. 3,889,571, Cl. 86-1.00R.

Cohen, Noal; Rosenberger, Michael; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Process for preparing 3-(3-cyanopropyl)-6a-methyl-4a-hydroxyperhydro-3h-naphtha[2,1-b]benzopyran-7-ols and 3-(3-cyanopropyl)-6a-methyl-4a-hydroxyperhydro-3h-naphtha[2,1-b]benzopyran-7-ones as steroid intermediates. 3,890,354, Cl. 260-343.500.

Cohnen, Wolfgang: *See—*
Serini, Volker; Vernaleken, Hugo; and Cohnen, Wolfgang, 3,890,266.

Coiner, Ronald W., to Westinghouse Air Brake Company. Electrically controlled fluid pressure system for converting digital control signals to analog signals. 3,890,013, Cl. 303-20.000.

Coleman, James H., to Sprague Electric Company. Electrical component with offset radial leads. 3,890,546, Cl. 317-258.000.

Colgate-Palmolive Company: *See—*
Clancy, David, 3,889,941.
Taylor, Glenn N., 3,889,679.

Collins, Donald S.; and Peoples, Patrick J., to Howell Laboratories, Inc. Glossmeter for providing a linear response corresponding to true gloss readings. 3,890,049, Cl. 356-199.000.

Collins, Harvey H., to Package Machinery Company. Plastic injection molding machine. 3,890,308, Cl. 425-242.00R.

Collins, Robert F., to Kendall Company, The. Surgical drape. 3,889,667, Cl. 128-132.00D.

Colt Industries Operating Corp.: *See*—
Yankee, Herbert L.; and Hlavaty, Robert J., 3,889,516.

Combest, John F.; and Bell, Rupert B., to R. L. Kuss & Co., Inc. Fluid filter. 3,890,232, Cl. 210-223.000.

Combustion Engineering, Inc.: *See*—
McGough, Thomas Clifton, Jr., 3,889,552.
Ranger, Eugene, 3,889,820.

Command Automation, Inc.: *See*—
Simjian, Luther G., 3,890,599.

Commonwealth Scientific and Industrial Research Organisation and Imperial Chemical Industries of Austrailia and New Zealand Limited: *See*—
Weiss, Donald Eric; and Battaerd, Hendrik Adriaan Jacobus, 3,890,224.

Communications Satellite Corporation: *See*—
Beyer, John P., 3,890,571.
Sciulli, Joseph A., 3,890,467.

Compagnie de Construction Mechanique Sulzer: *See*—
Fehr, Henri; and Mallen-Herrero, Jose, 3,890,515.

Compagnie Generale des Establissements Michelin, raison sociale Michelin & Cie.: *See*—
Lejeune, Daniel, 3,890,008.

Computer Peripherals, Inc.: *See*—
Silverman, Ira; and Irvine, James M., 3,889,893.

Comstock & Wescott, Inc.: *See*—
Aspinwall, Peter; and Barbour, Richard H., Jr., 3,889,564.

Conde Kabushiki Kaisha: *See*—
Himeno, Shohachi, 3,889,368.

Consolidated Packaging Corporation: *See*—
Berg, Robert A., 3,889,867.

Container Corporation of America: *See*—
Helms, Charles Robert, 3,889,808.

Continental Can Company, Inc.: *See*—
Szpitalak, Wesley J., 3,889,630.

Converse, Vernon G., III: *See*—
Grikscheit, Henry W.; and Converse, Vernon G., III, 3,889,528.

Cook, George W.: *See*—
Dewey, John L.; Cook, George W.; and Scott, Charles E., 3,890,427.

Copenhaver, Julian V., Jr.: *See*—
Stevens, Douglas; Forberg, Helge O.; Jennings, Larry D.; Stephens, Frank M., Jr.; Bowen, Francis J.; Thompson, David L.; and Copenhaver, Julian V., Jr., 3,890,425.

Corning Glass Works: *See*—
Walker, Edward S., 3,889,891.

Corrigan, John Francis, to Enamel Varnish & Chemical Company of Australia Pty. Limited. Method and compositions for protecting surfaces. 3,890,265, Cl. 260-33.6UB.

Corsi, Domenico: *See*—
Giangaspero, Michele; Tlustos, Giorgio; and Corsi, Domenico, 3,890,401.

Cotts, Ronald F., to IU Conversion Systems, Inc. Roll-pelletizer for making uniform particle size pellets. 3,890,080, Cl. 425-363.000.

Coulter Electronics, Inc.: *See*—
Coulter, Wallace H.; and Hogg, Walter R., 3,890,568.
Hogg, Walter R., 3,890,569.

Coulter, J. Roland: *See*—
Toman, Donald J.; and Coulter, J. Roland, 3,890,620.

Coulter, Wallace H.; and Hogg, Walter R., to Coulter Electronics, Inc. Method and apparatus for particle length measurement. 3,890,568, Cl. 324-71.0CP.

Couture, J. Walter, to Black Clawson Company, The. Pulping apparatus. 3,889,885, Cl. 241-46.110.

Cowling, Richard James: *See*—
Schlesinger, Sheldon Irwin; Boszak, Ronald J.; Shuppert, Laurence Verlan; and Cowling, Richard James, 3,890,149.

Craig, Carlton E.: *See*—
Bode, Charles H., Jr.; Craig, Carlton E.; Friend, Donald L.; Lazzaretti, Louis G.; and Wagner, George J., Jr., 3,889,344.

Cramer, William H. Automobile accelerator locking device. 3,889,499, Cl. 70-202.000.

Crane, Grant; Kay, Edward L.; and Laman, Joseph R., to Firestone Tire & Rubber Company, The. Conversion of scrap rubber to fuel and useful by-products. 3,890,141, Cl. 75-86.000.

Crausaz, Rene: *See*—
Steinegger, Hans; Glauser, Walter; Rossier, Jean-Pierre; Crausaz, Rene; and Matthey-Doret, Pierre Andere, 3,889,428.

Crawford, Douglas J.: *See*—
Hughes, Francis H.; and Crawford, Douglas J., 3,889,612.

Creators Limited: *See*—
Stent, Vernon Dennis; and Wright, Derek Cecil, 3,890,181.

Crompton & Knowles Corporation: *See*—
Roberson, James H., 3,889,319.

Cronk, Don Ray: *See*—
Davis, Rodney L.; Cronk, Don Ray; and Hansen, Carl C., 3,889,392.

Croset, Michel; and Velasco, Gonzalo, to Thomson-CSF. Short wavelength waveguides. 3,889,361, Cl. 29-600.000.

Cryder, John R.; and Hall, Lowell R., to Caterpillar Tractor Co. Tandem master cylinder with in-line check valves. 3,889,469, Cl. 60-562.000.

CTS Corporation: *See*—
Van Benthuysen, John D.; and English, Jack A., 3,890,590.

Cuisia, Dionisio Guerrero: *See*—
Hwa, Chih Ming; Cuisia, Dionisio Guerrero; and Gray, John Allen, 3,890,228.

Cullingford, Christopher Varndell: *See*—
Widdowson, Neville Bruce; and Cullingford, Christopher Varndell, 3,890,516.

Cunningham, Lonnie C.; and Travis, Thomas P. Liquid dispersal apparatus. 3,889,881, Cl. 239-70.000.

Curran, Adrian Charles Ward: *See*—
Wood, Hamish Christopher Swan; Stuart, Alexander; Curran, Adrian Charles Ward; and Al-hassan, Saieba, 3,890,387.

Current Industries, Inc.: *See*—
Horowitz, Victor, 3,890,534.

Curry, John Downing, to Procter & Gamble Company. Antibacterial detergent compositions containing phenylbismuth bis(2-pyridinethiol 1-oxide). 3,890,242, Cl. 252-107.000.

Curtis, David, to Hooker Chemicals & Plastics Corporation. Manufacture of hydrazine. 3,890,216, Cl. 204-177.000.

Curtis, Herbert E., to MB Associates. Cartridge assembly for a gas powered weapon system including a pressure responsive seal. 3,889,652, Cl. 124-41.000.

Cushman, Donald R.; Oberright, Edward A.; Edwards, Roy T., deceased; and by Edwards, Katherine, legal representative, to Mobil Oil Corporation. Wax emulsions for controlling transpiration in plants. 3,890,158, Cl. 106-271.000.

Cutler-Hammer, Inc.: *See*—
Hartop, Robert William, 3,890,585.

Cutter Laboratories, Inc.: *See*—
Miller, George E., Jr.; Kahn, Paul; and Dabney, William C., 3,889,685.

Dabney, William C.: *See*—
Miller, George E., Jr.; Kahn, Paul; and Dabney, William C., 3,889,685.

Daimler-Benz Aktiengesellschaft: *See*—
Wilfert, Karl; and Barenyi, Bela, 3,889,968.

Dainippon Screen Seizo Kabushiki-Kaisha: *See*—
Miyauchi, Yoshio; and Okuno, Tetsuji, 3,890,042.

D'Alelio, Gaetano Francis, to University of Notre Dame du Lac. Polymerizing bis-maleimides. 3,890,272, Cl. 260-47.0UA.

D'Alelio, Gaetano Francis, to University of Notre Dame du Lac. Phthalonitrile-terminated aromatic polyimides. 3,890,274, Cl. 260-47.0CP.

Daly, Richard H.; Brink, Robert V.; and Andersen, Kare, to Chicago Rawhide Manufacturing Company. Injection molding apparatus. 3,890,082, Cl. 425-451.900.

Dalziel, Warren L., to Shugart Associates. Flexible disk drive cartridge loading apparatus. 3,890,643, Cl. 360-99.000.

Danielewicz, John C.; Snarey, Michael; and Thomas, Geoffrey N., to Pfizer Inc. (2-Imidazolin-2-yl(amino) substituted quinolines, -quinoxalines and -quinazolines as antihypertensive agents. 3,890,319, Cl. 260-250.00Q.

Daniels, Elon, Jr., to General Motors Corporation. Method and apparatus for preventing curling of lead strips during expansion. 3,890,160, Cl. 136-36.000.

Danielson, Claes Otto Sigfrid; Andersson, Claes-Goran Staffan; and Gram, Hans-Ake Christian, to Helsingborgs Spikfabriks AB. Methods and apparatuses for making strips of nails for use in nail driving tools. 3,889,450, Cl. 53-198.00R.

Danke, Rudolph B., to Simplex Time Recorder Company. Time recorder. 3,890,624, Cl. 346-91.000.

Dann, Bert H.: *See*—
Guisinger, Barrett Earl; and Dann, Bert H., 3,890,558.

Date, Koki: *See*—
Oguri, Eizo; Ogawa, Hiroshi; Date, Koki; and Takeba, Kanji, 3,889,388.

Daubert Chemical Company: *See*—
Bohme, Reinhard D.; and Ilagan, Perlita A., 3,890,292.

David, Pierre Y.; Charles, Joel M.; and Toscano, Robert Julien Antoine, to Etat Francais. Winch with constant tension cable. 3,889,928, Cl. 254-172.000.

Davidson, Alan John: *See*—
George, Edwin Francis; and Davidson, Alan John, 3,890,130.

Davidson, Robert R., to Borg-Warner Corporation. Sealing arrangement for a fluid pressure device. 3,890,068, Cl. 418-132.000.

Davies, Timothy Alan, to United Kingdom Atomic Energy Authority. Methods of treating solid substances with a vapor. 3,890,424, Cl. 423-19.000.

Davis, Frank H.; Wolfe, Homer O., Jr.; and Clapp, Billy D., to Certainteed Products Corporation. Method for packaging fiber glass insulation. 3,889,444, Cl. 53-24.000.

Davis, JLee, to Advance Oil and Gas Co., Inc. Multi-directional seismic exploration methods on navigable water. 3,890,593, Cl. 340-15.5MC.

Davis, Richard P. Method of making printed circuit boards. 3,889,363, Cl. 29-625.000.

Davis, Robert L., to Rohm and Haas Company. Pallet for large coil of sheet material and cooperating roller stand for dispensing sheet material from coil. 3,889,831, Cl. 214-340.000.

Davis, Rodney L.; Cronk, Don Ray; and Hansen, Carl C., to Whirlpool Corporation. Self-aligning integral lint screen handle and lid for a dryer. 3,889,392, Cl. 34-82.000.

Davis, Steven S., to Envirotech Corporation. Vacuum filter. 3,890,235, Cl. 210-330.000.

Davis, Thomas G.: *See*—
McFarlane, Finley E.; and Davis, Thomas G., 3,890,256.

Dawson, Gordon William; and Dixon, Howard Meredith, to Sangamo Weston Limited. Thermocouples. 3,890,162, Cl. 136-230.000.

Day, Donald L.; Halstead, Charles H.; and Huck, Neil F., to Textron Inc. Metal roof. 3,889,437, Cl. 52-520.000.

Day, John J.; and Hirschman, Paul S., to Ocean Protein Corporation. Rearing tank for aquatic animals. 3,889,639, Cl. 119-2.000.

Dazey Products Co.: *See—*
McNair, Samuel L., 3,889,809.

de la Pena, Ramon: *See—*
Celada, Juan; MacKay, Patrick W.; and de la Pena, Ramon, 3,889,864.

DeAngelis, Gerald George; and Hess, Hans-Jurgen Ernst, to Pfizer Inc. 6-Aryl-5-ethyl-pyrimidin-4-ol compounds useful as intermediates and bronchodilators. 3,890,321, Cl. 260-251.00R.

Deardurff, Lawrence R., to Owens-Corning Fiberglas Corporation. Method of making electric conductor. 3,890,179, Cl. 156-53.000.

de Boer, Jan, to U.S. Philips Corporation. Electric dry shaver. 3,889,371, Cl. 30-34.100.

De Boer, Jan J.; and Borsten, Herman, to Nederlandse Organisatie Voor Toegepast-Natuurweten-Schappelijk Onderzoek Ten Behoeve Van Nijverheid, Handel En Verkeer. Preparation of cotton yarns from slivers and rovings. 3,889,328, Cl. 28-76.00R.

Deere & Company: *See—*
Obadal, Richard Dick; and Loynachan, William David, 3,889,717.

Deering Milliken Research Corporation: *See—*
Owings, Joe T.; and Martin, Sarden B., 3,889,718.

Deguchi, Michiyuki, to Ugen-Kaisha Overu Engineering. Cassette reel hub for a tape recorder. 3,889,894, Cl. 242-74.000.

Delap, Joseph A.: *See—*
Dietz, Richard E.; and Delap, Joseph A., 3,890,249.

Delio, Ralph D. Steering knuckles and method of forming the same. 3,889,512, Cl. 72-377.000.

Della Vite, Romuald Rene, to Societe Francaise d'Etiquetage Virey & Garnier. Bottle labelling machine. 3,890,192, Cl. 156-571.000.

Delle-Alsthom: *See—*
Thuries, Edmond; and Joly, Francois, 3,890,479.

Del Signore, Giancarlo: *See—*
Montesissa, Giorgio; and Del Signore, Giancarlo, 3,890,259.

Demarest, Donald M., to General Electric Company. Gate pulse power supply for static alternating current switches. 3,890,561, Cl. 323-24.000.

Deminsky, Jury Andreevich: *See—*
Bogdanov, Georgy Yakovlevich; Deminsky, Jury Andreevich; Zax, Mikhail Isaakovich; and Tsygankov, Jury Viktorovich, 3,890,557.

Denhart, Robert R. Self-contained voice amplification headgear. 3,890,475, Cl. 179-156.00A.

Denis, Roger; and Barnett, Jewell M., to said Roger Denis, by said Jewell M. Barnett. Vacuum curettage device. 3,889,682, Cl. 128-304.000.

Denouter, Pieter J.; and Grolman, Bernard, to American Optical Corporation. Device for consistent response to a fluid pulse and method and apparatus for verifying instruments utilizing fluid pulses. 3,889,518, Cl. 73-4.00R.

Dentsply Research & Development Corporation: *See—*
Saffir, Jacob A., 3,889,374.

Desblanche, Andre Eugene; and Pierret, Jean Marc, to International Business Machines Corporation. Method and apparatus for equalizing phase-modulated signals. 3,890,572, Cl. 325-42.000.

Deslauriers, Clovis F. Stripping machine. 3,889,863, Cl. 225-99.000.

DeSourdis, Paul L., to Felters Company, The. Machinery mount. 3,889,907, Cl. 248-24.000.

Dettmeier, Odo: *See—*
Gehrmann, Klaus; Ohorodnik, Alexander; Dettmeier, Odo; and Berns, Heinz-Josef, 3,890,399.

Devol, George C.; and Martin, Paul S. Dual-armed multi-axes program controlled manipulators. 3,890,552, Cl. 318-568.000.

Dewey, John L.; Cook, George W.; and Scott, Charles E., to Reynolds Metals Company. Recovery of gallium. 3,890,427, Cl. 423-129.000.

Diamond, Allen M., to Beckman Instruments, Inc. Direct coupled amplifier in null balance circuit or the like. 3,890,553, Cl. 318-678.000.

Diamond Shamrock Corporation: *See—*
Benezra, Leo L., 3,890,329.
Metz, Fred L.; and Scozzie, James A., 3,890,345.

DiBenedetto, Anthony J., to Gurtler Hebert & Co., Inc. Apparatus for welding together substantially vertically extending pipe sections. 3,890,482, Cl. 219-73.000.

DieComp, Inc.: *See—*
McFadden, Daniel G.; and Levine, Richard C., 3,889,876.

Diery, Helmut; Hess, Peter; Schneider, Karl-Heinz; and Schneider, Gerhart, to Hoechst Aktiengesellschaft. Mercerizing solutions. 3,890,093, Cl. 8-127.000.

Diesel Truck Drivers Training School Inc.: *See—*
Klabacka, Robert, 3,889,957.

Dietz, Richard E.; and Delap, Joseph A., to Phillips Petroleum Company. Silica preparation. 3,890,249, Cl. 252-458.000.

Dijkstra, Rinse; and Van den Broek, Arnoldus Johannes Maria, to U.S. Philips Corporation. Positive-acting napthoquinone diazide photosensitive composition. 3,890,153, Cl. 96-91.00D.

Dillard, Robert D., to Eli Lilly and Company. 5,5-Dialkyl-3-pyrroline-2,2-dicarboxylic acid esters. 3,890,349, Cl. 260-326.460.

Dillon, Alfred J.: *See—*
Jones, Chester L. M.; Yoakam, Raymond J.; Hazar, Mitchell M.; and Dillon, Alfred J., 3,889,904.

Dillon, William E., to Skil Corporation. Vibration isolation handle for portable chain saw or the like. 3,889,763, Cl. 173-162.000.

DiLorenzo, James Vincent; Niehaus, William Charles; Rode, Daniel Leon; and Schwartz, Bertram, to Bell Telephone Laboratories, Incorporated. Electrochemical thinning of semiconductor devices. 3,890,215, Cl. 204-129.200.

Dils, Ray R., to United Aircraft Corporation. Process of coating a gas turbine engine alloy substrate. 3,890,456, Cl. 428-216.000.

Dimmick, George D.: *See—*
Patel, Himanshu M.; and Dimmick, George D., 3,890,527.

Director-General, Agency of Industrial Science & Technology Co. Ltd.: *See—*
Hasegawa, Masaki; Nakanishi, Fusae; Nakanishi, Hachiro; Watanabe, Shoji; Suzuki, Yasuzo; Nakane, Hisashi; Aoyama, Toshimi; Komatsubara, Yukio; Nojima, Setsuo; and Tagami, Hiroshi, 3,890,150.

Dison, James R., to General Motors Corporation. Grease retainer for engaged splines. 3,889,780, Cl. 184-1.00R.

Di Veto, Hilliard R.: *See—*
Goetzinger, Gunther R.; and Di Veto, Hilliard R., 3,890,644.

Dixon, Howard Meredith: *See—*
Dawson, Gordon William; and Dixon, Howard Meredith, 3,890,162.

Dixon, William Jennings, Jr., to R. H. Bouligny, Inc. Hydraulic pressure intensifier system. 3,889,340, Cl. 29-203.0DT.

Dobson, Kenneth Rowland, to BP Chemicals International Limited. Halogenated octyl esters. 3,890,375, Cl. 260-475.00R.

Dobson Park Industries Limited: *See—*
Sumner, Brian, 3,889,762.

Dolak, Lester A., to Upjohn Company, The. Process for n-acylating novenamine. 3,890,297, Cl. 260-210.00R.

Domenico, Penelope B., to Dow Chemical Company, The. Halopyridyl thioalkylthio cyanates. 3,890,332, Cl. 260-294.80G.

Domenighetti, Domenico. Combined-action vibro compacting machine for the construction or roads. 3,890,056, Cl. 404-117.000.

Dominy, Beryl W., to Pfizer Inc. Herbicidal 1H-pyrazolo[3,4-d]pyrimidin-4-ones. 3,890,132, Cl. 71-92.000.

Donnelly, William R., to Readi Temp, Inc. Heat transfer package with shaped frangible ampule. 3,889,483, Cl. 62-4.000.

Donner, William E.: *See—*
McKee, Lewis W.; Donner, William E.; Oliva, Victor B.; Berglund, Harold R.; and Morrison, John C., 3,889,456.

Dorland, Charles Kenneth. Symmetrical sail assembly. 3,889,620, Cl. 114-39.000.

Dorman, Douglas E.: *See—*
Smith, Susan L.; and Dorman, Douglas E., 3,890,325.

Dorr, Hans Werner: *See—*
Grosse, Ludwig; and Dorr, Hans Werner, 3,890,180.

Dotts, Gerald Dean. Platform lift. 3,889,778, Cl. 182-17.000.

Dougherty, Emery W. Liquid dental opaquer and method. 3,889,385, Cl. 32-12.000.

Dove, Curtis N., Jr.; and George, Jimmie, to Flotation Trailer Trac, Inc. Flotation/tire/assembly. 3,890,010, Cl. 301-52.000.

Dovey, Brian H.; Bartner, Elliot; Kaplan, Sheldon; and Sarnoff, Stanley J., to Survival Technology, Inc. Tip assembly for syringes. 3,889,673, Cl. 128-215.000.

Dow Chemical Company, The: *See—*
Domenico, Penelope B., 3,890,332.
Filter, Harold E.; Bidlack, Harvey D.; and Stevens, Don L., 3,890,172.
Filter, Harold E.; and Bidlack, Harvey D., 3,890,173.
Kuhn, Stephen J., 3,890,394.
Moore, William R.; and Vaughn, Walter L., 3,890,287.
O'Melia, Frances C., 3,890,440.
Priddy, Duane B., 3,890,316.
Rodia, Ralph M.; and Pews, R. Garth, 3,890,383.
Shatney, Robert H., 3,890,447.

Dow Corning Corporation: *See—*
Frye, Cecil L.; and Klosowski, Jerome M., 3,890,334.
Kendrick, Thomas C.; and Ward, Andrew H., 3,890,405.
Kokoszka, John G., 3,890,271.

Dow Corning Limited: *See—*
Chandra, Grish, 3,890,359.

Dowa Co., Ltd.: *See—*
Miyahara, Kingo, 3,890,086.

Dowling, Donald J.; Boyd, John F.; and Fuchs, James A., to Texaco Inc. Permeability log using new lifetime measurements. 3,890,502, Cl. 250-267.000.

Dowling, Donald J.; and Savage, Kerry D., to Texaco Inc. Magnetic susceptibility logging apparatus for distinguishing ferromagnetic materials. 3,890,563, Cl. 324-6.000.

Downen, Jim: *See—*
Sutliff, Wayne N.; and Downen, Jim, 3,889,766.

Dowty Mining Equipment Limited: *See—*
Cheshir, Keith; and Farr, Peter, 3,889,986.

Dravo Corporation: *See—*
Jaquay, Louis Harold, 3,889,933.
Malcolm, Donald B., 3,889,391.

Dressel, Herman O.: *See—*
Hutter, Rudolf G. E.; and Dressel, Herman O., 3,890,529.

Dresser Industries, Inc.: *See—*
Biek, Paul Albert, 3,890,051.
Clamon, Robert Dale, 3,890,018.
Glover, Charles J., 3,889,324.
Peterson, George N., 3,890,117.

Drill Systems Inc.: *See—*
Becker, Floyd W., 3,889,927.

Du Charme, Leon: *See—*
Jackson, John G., 3,889,764.

Duco S.p.A.: *See—*
Montesissa, Giorgio; and Del Signore, Giancarlo, 3,890,259.

Duff-Norton Company: *See—*
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Duncan, Gorden E. Shock absorber nut removing tool. 3,889,558, Cl. 81-55.000.
Dunn, Byron G. Motor vehicle fire extinguisher. 3,889,752, Cl. 169-59.000.
Dunn, Byron G. Fire extinguishing system. 3,889,754, Cl. 169-59.000.
Dunn, Byron G. Electrical appliance fire extinguisher. 3,889,755, Cl. 169-59.000.
Dunn, Byron G. Marine vessel fire extinguisher. 3,889,756, Cl. 169-59.000.
Dunn, Byron G. Commercial cooking unit fire extinguisher. 3,889,757, Cl. 169-59.000.
Dunn, Byron G. Hand operable fire extinguisher. 3,889,758, Cl. 169-74.000.
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Dunsworth, William K.; and Geil, Fred G., to Westinghouse Electric Corporation. Technique for minimizing loss of sensitivity of buried pressure responsive devices. 3,890,613, Cl. 340-407.000.
Dunwoodie, Duane E.: *See—*
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Duturbure, Stanley Francis, to Hoswell, Vicki Lorraine; Duturbure, Michael Roy; and Walker, Ronda Lynne. Catheter tube. 3,889,686, Cl. 128-349.00B.
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Dycus, Dale W.; Malmberg, Earl W.; and Wilchester, Harry L., to Sun Oil Company. Surfactant compositions useful in oil recovery processes. 3,890,239, Cl. 252-8.55D.
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Eamkaow, Precha. Tracheostomy tube with novel retaining means. 3,889,688, Cl. 128-351.000.
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Easley, Sydney E.: *See—*
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Eburn, William H., Jr., to Automation & Product Development Corporation. Apparatus for forming and applying tin-tie fasteners. 3,890,190, Cl. 156-521.000.
Eckerle, Otto. Axially and radially compensated high pressure gear pump. 3,890,066, Cl. 418-71.000.
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Eder, Theodor, to Wagner-Bird Aktiengesellschaft. Process and apparatus for classifying granular material suspended in a liquid. 3,890,229, Cl. 210-73.000.
Eder, Ulrich; Haffer, Gregor; Ruppert, Jurgen; Sauer, Gerhard; and Wiechert, Rudolf, to Schering Aktiengesellschaft. 9,10-Secoestrane derivatives and their production. 3,890,391, Cl. 260-590.000.
Edes, Ferenc; and Gianatasio, Henry L., to Air-Trol Systems, Inc. Web-tension sensing and control apparatus. 3,889,895, Cl. 242-75.430.
Edmonds, William H., to Quisenberry, J. L. Leak and corrosion resistant, yieldable freeze plug. 3,889,841, Cl. 220-200.000.
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Eftefield, Larry G., to Caterpillar Tractor Co. Hoeing apron mechanism. 3,889,404, Cl. 37-126.0AD.
Eichelberger, Charles W.; Engeler, William E.; and Tiemann, Jerome J., to General Electric Company. Apparatus for sensing radiation and providing electrical readout. 3,890,500, Cl. 250-211.00J.
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Eickmann, Karl. Pressure-responsive control body for use in fluid handling devices. 3,889,577, Cl. 91-487.000.
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Eller, J. Marlin; and Eller, J. David. Suspended submersible pumping unit. 3,890,065, Cl. 417-360.000.
Elliott, James Madison. Finishing plug. 3,889,436, Cl. 52-514.000.
Ellis, Robert. Billiard table with accessories. 3,889,945, Cl. 273-6.000.
Elsner, Edwin C., deceased; and Elsner, Viola Hazel, executrix, to Fink, Max; and Hahn, Floyd G., part interest to each. Mechanism for indicating load tension on a fastening device. 3,889,526, Cl. 73-88.00F.
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Enamel Varnish & Chemical Company of Australia Pty. Limited: *See—*
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Engeler, William E., to General Electric Company. Variable capacitance semiconductor devices. 3,890,635, Cl. 357-14.000.

Engeler, William E.: *See—*
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Ettischer, Helmut, to Eastman Kodak Company. Adjusting means for cameras having several lenses. 3,890,626, Cl. 354-197.000.
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Evans, Allan P., to United States of America, Navy. Process for reducing friction loss in flowing organic fluids. 3,889,702, Cl. 137-13.000.
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Falconi, Lodovico. Frame for bicycles, motor bicycles and the like. 3,889,975, Cl. 280-281.000.
Faltin, Hans G., to Advance Enterprises, Inc. Auxiliary cut-off unit for web printing presses and method of forming severed pieces. 3,889,939, Cl. 270-21.000.
Fanciullo, Anthony. Sealing washer for high torque spinning bolt-head outdoor uses. 3,889,569, Cl. 85-1.0JP.
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Glaski, Frederick A., 3,890,110.
Farmer, Ernest Leonard; and Ecob, Osmond Herbert, to Wildt Mellor Bromley Limited. Yarn float controller means for circular knitting machines. 3,889,493, Cl. 66-19.000.
Farnam, Robert G., to F. D. Farnam Co. Molded type heat insulating gasket. 3,889,961, Cl. 277-166.000.
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Fay, H. Peter; and Peck, William S., to General Atomic Company. Pressure relief system for a nuclear reactor. 3,889,707, Cl. 137-251.000.
Fazlin, Fazal A. Process for making color television masks. 3,889,329, Cl. 29-25.140.
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Fehr, Henri; and Mallen-Herrero, Jose, to Compagnie de Construction Mechanique Sulzer. Magnetic coupler for coupling rotary shafts. 3,890,515, Cl. 310-104.000.
Fehseke, Richard L. Opposite side centering and hold-down trailer uprights. 3,889,973, Cl. 280-179.00A.
Feinberg, Robert S.; and Selick, David A. Means for preserving tennis balls or the like. 3,889,807, Cl. 206-315.000.
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Ferraro, Frank A., to Warner-Lambert Company. Shaving unit for safety razor. 3,889,369, Cl. 30-346.580.
Ferri, Antonio, to Advanced Technology Laboratories, Inc. Apparatus for reducing formation of oxides of nitrogen in combustion processes. 3,890,088, Cl. 431-351.000.
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Fieuzal, Jean Henri; Bourgine, Louis; and Benzoni, Rene Pierre, to Etat Francais. Reversible-output rotary gear device. 3,889,549, Cl. 74-409.000.
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Filecci, Joseph E. Double action trigger mechanism for semi-automatic pistol. 3,889,412, Cl. 42-69.00B.
Filter, Harold E.; Bidlack, Harvey D.; and Stevens, Don L., to Dow Chemical Company, The. Solid propellant composition with aziridine cured epichlorohydrin polymer binder. 3,890,172, Cl. 149-19.600.
Filter, Harold E.; and Bidlack, Harvey D., to Dow Chemical Company, The. Solid propellant containing ethylene-carboxylic acid polymers cured with azeridine-based resins. 3,890,173, Cl. 149-19.910.
Filter, Walther, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft; and Etablissement Wanderfield & Co. Weaving machine comprising shuttle braking means. 3,889,723, Cl. 139-186.000.
Finch, Neville; and Vlattas, Isidoros, to Ciba-Geigy Corporation. Preparation of oximes. 3,890,369, Cl. 260-468.00D.
Fine, Boyce. Truck loading and unloading apparatus. 3,889,827, Cl. 214-77.00P.
Fingerle, Alfred A., to Sun Oil Company of Pennsylvania. Sample vaporizer for gas chromatography. 3,889,538, Cl. 73-422.0GC.
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Fitzgerald, Kenneth D., to Petro-Tex Chemical Corporation. High solids chloroprene polymer latex. 3,890,261, Cl. 260-23.70H.

Fitzgerald, Robert C., to Equipment Development Corporation. Aquarium-tank heating control. 3,890,486, Cl. 219-523.000.

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Flood, Janet M. Device for composing traceable forms. 3,889,397, Cl. 35-26.000.

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FMC Corporation: *See—*
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Fort, Charles P. Combination electrical and mechanical lock system. 3,889,501, Cl. 70-283.000.

Fortine, Eugene A., to Simpson Manufacturing Co., Inc. Mudsill tie-down. 3,889,441, Cl. 52-715.000.

Fowler, Raymond H., to ICI United States Inc. Phosphate salts of amine based polyols. 3,890,389, Cl. 260-584.00B.

Fox, Eugene J.; and McChesney, James D., to Kansas University Endowment Association. Cytokinin-7-nucleoside. 3,890,299, Cl. 260-211.50R.

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Frangmeier, Alvin W. Rain gutter attachments. 3,889,474, Cl. 61-14.000.

Frank, Rudolf; Witzig, Karl Emil; and Witzig, Armin, to Frank, Rudolf; and Witzig, Karl Emil. Indexing-type work platform for machine tools. 3,889,555, Cl. 74-826.000.

Frankfurt, Sandor. Cooling system for beverage coolers. 3,889,487, Cl. 62-99.000.

Frantz, Virgil L., to Graham-White Sales Corp. Plural-stage air filter assembly. 3,890,122, Cl. 55-212.000.

Fraser, Donald J. Jig for precast brick-wall panels. 3,889,917, Cl. 249-64.000.

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Frederick, Leonard Long. Jet sheet and circular pile with water hammer assist. 3,889,482, Cl. 61-53.500.

Freeman, Gerald C.: *See—*
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Freize, Ronny G.; and Ferguson, George R., to Duff-Norton Company. Rotary fluid joint. 3,889,983, Cl. 285-13.000.

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Frische, Dale George, to Indian Head Inc. Bottle chuck having a snap-on snap-off coupling. 3,889,800, Cl. 198-179.000.

Fritsch, Rudolf Paul. Extrusion and cooling plant for plastics strands. 3,890,074, Cl. 425-71.000.

Frontier Engineering Corporation: *See—*
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Frye, Cecil L.; and Klosowski, Jerome M., to Dow Corning Corporation. Tetrasila-adamantane compounds. 3,890,334, Cl. 260-297.00F.

Fryer, Robert B. Ambulance cot with cardiopulmonary resuscitation seat and method of administering cardiopulmonary resuscitation. 3,889,663, Cl. 128-28.000.

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Fujio, Ryota: *See—*
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Futer, Rudolph E. Supplying objects from an air-film conveyor rapidly and intermittently to a machine. 3,890,011, Cl. 302-31.000.

G. D. Searle & Co.: *See—*
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Gagnon, Rudolph A.; and Matt, Ann K. Measuring and dispensing device. 3,889,854, Cl. 222-284.000.

Gailey, Robert McNaught; and Hurley, Joseph John, to J. & P. Coats, Limited. Method of and apparatus for producing liquid impregnated fibrous material. 3,889,634, Cl. 118-325.000.

Galan, Felix: *See—*
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Galicia, Frank. Oil separation and recovery device. 3,890,234, Cl. 210-242.000.

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Garberi, Sergio; and Bertino, Lorenzo, to Ing. C. Olivetti & C., S.p.A. Removable cartridge for the inked ribbon for typewriters, calculating machines or other office machines. 3,889,795, Cl. 197-151.000.

Gardner, Conrad O. Exhaust emission control systems and devices. 3,889,464, Cl. 60-286.000.

Gardner, John E. Football blocking sled. 3,889,949, Cl. 273-55.00R.

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Garris, Charles R., to SmithKline Corporation. Quality control monitor for medicinal capsule packaging apparatus. 3,889,447, Cl. 53-53.000.

Garst, Frederick, to Occanneechi Orchards, Inc. Method and apparatus for automatic folding of a space divider. 3,889,580, Cl. 93-37.0SP.

Gartland, Albert J., Jr., to Harvey Hubbell, Incorporated. Wire-form grounding clip for electrical fixtures. 3,890,026, Cl. 339-21.00R.

Gartmann, Hans, to Swiss Corporation Limited. Pressure compensated expansion joint. 3,889,985, Cl. 285-95.000.

Gartner, Falk, to Motoren-Werke Mannheim AG. Apparatus for controlling the power of a hot-gas piston engine. 3,889,465, Cl. 60-521.000.

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Gathmann, Dietrich; and Mayland, Walter, to ERNO Raumfahrttechnik GmbH. Catalytic action gas generator. 3,890,102, Cl. 23-282.000.

Gautherin, Guy; and Aubert, Jean, to Agence National de Valorisation de la Recherche (ANVAR). Ion sources. 3,890,535, Cl. 315-111.000.

Gauthier, Michel; Tessier, Marcel; Fleruy, Daniel; and Jegousse, Michel, to Centre National pour l'Exploitation des Oceans; and Le Nickel, part interest to each. Method and apparatus for continuous underwater mining using plural ships. 3,889,403, Cl. 37-69.000.

Gavin, David F., to Olin Corporation. Process for preparing 3-trichloromethyl-5-ethoxy-1,2,4-thiadiazole from trichloroacetonitrile in ethanol. 3,890,339, Cl. 260-302.00D.

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Geertson, Phillip W. Bee board cleaner. 3,889,306, Cl. 6-12.00M.

Gehrmann, Klaus; Ohorodnik, Alexander; Dettmeier, Odo; and Berns, Heinz-Josef, to Hoechst Aktiengesellschaft. Process for the continuous manufacture of 3,4-dichlorobutene-1. 3,890,399, Cl. 260-654.00R.

Geihl, Jerry L. Foldable modular shelter unit removably secured to a vehicle. 3,889,432, Cl. 52-69.000.

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Geis, Warren P., to Koehring Company. Material handling vehicle having high ground clearance power transmission and wheel support means. 3,889,782, Cl. 187-9.000.

Geisthoff, Hubert, to Jean Walterscheid GmbH. Three-point attachment device particularly for a tractor. 3,889,980, Cl. 280-461.00A.

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Genta, Guido R., to American Aniline Products, Inc. Polyester textile dyed with yellow ester dyestuffs. 3,890,094, Cl. 8-179.000.

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George, Clarence E. Descent escape device. 3,889,777, Cl. 182-6.000.

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Gischel, Edwin H. Apparatus for filtering radioactive fluids. 3,890,233, Cl. 210-237.000.

Glaski, Frederick A., to Fansteel Inc. Composite coated steel structure for corrosion resistance. 3,890,110, Cl. 29-198.000.

Glassmeyer, John Joseph, to Pullman Incorporated. Barge construction. 3,889,619, Cl. 114-26.000.

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Glushko, Mikhail Fedorovich; Nikitinsky, Mikhail Pavlovich; Pakhomov, Ilya Fedorovich; and Kurgansky, Oleg Fedorovich. Arrangement for checking stability of self-supported objects. 3,889,524, Cl. 73-65.000.

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Goetzinger, Gunther R.; and Di Veto, Hilliard R., to Burroughs Corporation. Head mounting assembly for reading and writing on bank passbooks and the like. 3,890,644, Cl. 360-101.000.

Golborn, Peter; and Duffy, James J., to Hooker Chemicals & Plastics Corporation. Imidomethyl phosphonates. 3,890,275, Cl. 260-45.8NE.

Goldberg, Irving. Heat barrier textile material. 3,889,305, Cl. 5-345.00R.

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Goodman, David M. Cathode ray tubes with target screens and manufacture thereof. 3,890,507, Cl. 250-483.000.

Gordon, John Edson; and Halmos, Imre Aurel, to American Cyanamid Company. Method of preparing di 6-phenyl-2,3,5,6-tetrahydroimidazo[2,1-B]thiazole and acid addition salts thereof. 3,890,341, Cl. 260-306.70T.

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Grant, John, to United Kingdom Atomic Energy Authority. Flowmeters. 3,889,534, Cl. 73-194.00B.
Grasham, James A. Solitaire tic-tac-toe game. 3,889,953, Cl. 273-130.00B.
Grasselli, Robert K.; and Friedrich, Maria S., to Standard Oil Company. Catalysts for the oxidation of olefins to unsaturated aldehydes. 3,890,246, Cl. 252-432.000.
Gray, Edwin V., to Evgray Enterprises, Inc. Pulsed capacitor discharge electric engine. 3,890,548, Cl. 318-139.000.
Gray, Gene Louis. Electrical plug lock. 3,890,025, Cl. 339-14.00P.
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Guyot, Gilbert; Mathieu, Pierre; Philippe, Andre; Grancher, Pierre; and Solinhac, Jean, to Societe Nationale des Petroles. Process to recover sulphur from the sulphur compounds contained in residual gases. 3,890,120, Cl. 55-62.000.
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Habozit, Fortune, to La Cellophane. Method for biaxially drawing plastic films. 3,890,421, Cl. 264-289.000.
Hachenburg, Victor, to Bell Telephone Laboratories, Incorporated. Loop data transmission arrangement employing an interloop communication terminal. 3,890,471, Cl. 179-15.0AL.
Hack, Vila L., to Kurt & Mold & Die Co. Pleat-forming device. 3,889,858, Cl. 223-35.000.
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Ham, William Edward; and Flatley, Doris Winifred, to RCA Corporation. Stabilized semiconductor devices and method of making same. 3,890,632, Cl. 357-23.000.
Hamburger, Brigitte: *See*—
Kuhle, Engelbert; Klauke, Erich; Hamburger, Brigitte; and Scheinpflug, Hans, 3,890,386.
Hamilton, Richard J.: *See*—
Burns, Robert V.; and Hamilton, Richard J., 3,890,468.

Hammer, Edward E.; and Martyny, William C., to General Electric Company. Precoat for fluorescent lamp. 3,890,530, Cl. 313-489.000.

Hanami, Yuiti; and Fukuyama, Yoji, to Kurita Water Industries Ltd. Method of treating aluminum-containing waste water. 3,890,226, Cl. 210-44.000.

Hanchett, Leland J., to Taplin Business Machines Incorporated. Bar geometry verification system for bar-coded characters. 3,890,597, Cl. 340-146.30Z.

Hanks, James V., to Horton Manufacturing Co., Inc. Internal caliper brake. 3,889,784, Cl. 188-71.400.

Hansel, Gernot: *See*—
Wanner, Karl; Karl, Hubertus; Hansel, Gernot; Bleicher, Manfred; and Schmid, Wolfgang, 3,889,491.

Hansen, Carl C.: *See*—
Davis, Rodney L.; Cronk, Don Ray; and Hansen, Carl C., 3,889,392.

Hansen, David A., to University of Missouri, The Curators of the. Process for making improved strength dental amalgam. 3,890,144, Cl. 75-169.000.

Hansen, Kaj. Apparatus for picking up filamentous or long-fibred elements from fluid flowing through a chute. 3,889,810, Cl. 209-76.000.

Hanson, Howard G. Vehicle for transporting haystacks and the like. 3,889,832, Cl. 214-514.000.

Harada, Minoru, to Japanese National Railways. Double loop track system for railway freightyard and freight station. 3,889,603, Cl. 104-26.00R.

Harada, Seiki; Saiki, Atsushi; Okabe, Takahiro; and Sato, Kikuji, to Hitachi, Ltd. Multilayer wiring structure of integrated circuit and method of producing the same. 3,890,636, Cl. 357-68.000.

Harada, Shunichi; and Yoshihara, Takahisa, to Kawasaki Steel Corporation. Surface treatment of tinplate for improving sulfur resistance. 3,890,164, Cl. 148-6.200.

Harada, Tomio: *See*—
Fujii, Takao; Harada, Tomio; Namie, Koshi; and Takeda, Shinichi, 3,890,374.

Harada, Toshiaki: *See*—
Shimada, Keizo; Nishikawa, Takeo; Harada, Toshiaki; and Nagahama, Shizuo, 3,890,403.

Harbottle, William E., to Timken Company, The. Single row tapered roller bearing assembly capable of taking thrust loading in both axial directions and method of adjusting the same. 3,890,015, Cl. 308-1.00R.

Harding, William E.: *See*—
Aronstein, Jesse; and Harding, William E., 3,889,355.

Hardinge Brothers, Inc.: *See*—
Parsons, Hubert J., 3,889,962.

Hardtmann, Goetz E., to Sandoz, Inc. 3-Amino-2-(methylenedioxyphenyl)-acroleins. 3,890,350, Cl. 260-340.500.

Harich, Franz P.: *See*—
Harich, Jakob; and Harich, Franz P., 3,890,212.

Harich, Jakob; and Harich, Franz P., to Rush-Hampton, Inc. Useful product derived from grapefruit pulp. 3,890,212, Cl. 204-158.00R.

Harley, Daniel C.: *See*—
Nelson, Norman C.; and Harley, Daniel C., 3,890,555.

Harmening, Wayne Arthur, to RCA Corporation. Equipoise mechanism. 3,889,551, Cl. 74-469.000.

Harmon, James F.; Johnston, Richard D.; Lach, John H.; Von Der Lieth, William H.; and Murphy, Thomas L., to American Potato Company. Forming shaped potato pieces from potato dough. 3,890,453, Cl. 426-503.000.

Harold Schnair, Delta Quality: *See*—
Kelley, Charles N., 3,889,772.

Harper, Michael Ronald; and Fergus, Neil David, to Victor Products, Inc. One-way compression and starting release. 3,889,646, Cl. 123-48.00D.

Harrell, Bob G., to Jackes-Evans Manufacturing Company. Kick-proof access control handle. 3,889,498, Cl. 70-78.000.

Harrell, Gary W., to AG-Water, Inc. Filter structure. 3,890,236, Cl. 210-433.000.

Harris, Donald L.; and Hakim, Salomon. Shunt system for the transport of cerebrospinal fluid. 3,889,687, Cl. 128-350.00V.

Harris, Robert M., Jr., to Foremost-McKesson, Inc. Container construction. 3,889,834, Cl. 215-10.000.

Harsco Corporation: *See*—
Johnson, Paul R., 3,890,289.

Hart, Edwin J.; Vasudevan, Keelathur N.; and Schmidt, Klaus H., to United States of America, Energy Research and Development Administration. Condensation nucleus discriminator. 3,890,046, Cl. 356-37.000.

Hartigan, Edward G.: *See*—
Patience, Donald; Hartigan, Edward G.; and Knohl, Herbert, 3,889,494.

Hartop, Robert William, to Cutler-Hammer, Inc. Electrical switching apparatus. 3,890,585, Cl. 335-198.000.

Hartzell, George W.; and Gunnerman, Robert J., to Hartzell Industries, Inc. Sawmill. 3,889,566, Cl. 83-708.000.

Hartzell Industries, Inc.: *See*—
Hartzell, George W.; and Gunnerman, Robert J., 3,889,566.

Hartzog, Julian T., to Sperry Rand Corporation. Variable 8421 BCD multiplier. 3,890,496, Cl. 235-159.000.

Harvey Hubbell, Incorporated: *See*—
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Hasegawa, Masaki; Nakanishi, Fusae; Nakanishi, Hachiro; Watanabe, Shoji; Suzuki, Yasuzo; Nakane, Hisashi; Aoyama, Toshimi; Komatsubara, Yukio; Nojima, Setsuo; and Tagami, Hiroshi, to Director-General, Agency of Industrial Science & Technology Co. Ltd.; and Tokyo Ohka Kogyo Co., Ltd. Photosensitive compositions including aromatic bis-acrylic derivatives. 3,890,150, Cl. 96-33.000.

Hashiguchi, Setsuo; and Watanabe, Tatsuo, to Ichiko Industries Limited. Collapsible rear view mirror apparatus. 3,889,915, Cl. 248-475.00B.

Hasrouni, Youssef: *See*—
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Hassenauer, Robert L., to Evans Products Company. Car rock and roll hydraulic side bearing stabilizing arrangement. 3,889,607, Cl. 105-199.0CB.

Haugsjaa, Paul O.; and Casella, Daniel C., to GTE Laboratories Incorporated. Electret pulse generator. 3,890,511, Cl. 307-106.000.

Hayashi, Mamoru: *See*—
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Hayes, Edward J., to Kelsey-Hayes Company. Directionally responsive braking system. 3,890,014, Cl. 303-24.00R.

Haylock, John Christopher: *See*—
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Hazar, Mitchell M.: *See*—
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Heavy Light Mfg. Corp.: *See*—
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Heberlein & Co. AG.: *See*—
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Heckmann, Werner: *See*—
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Heilman, William J., to Gulf Research & Development Company. Method of preparing handleable, moldable resin compositions. 3,890,282, Cl. 260-78.50T.

Heinen, Harold J.; Carnahan, Thomas G.; and Eisele, Judith A., to United States of America, Interior. Chemical mining of copper porphyry ores. 3,890,007, Cl. 299-4.000.

Hejzlar, Sid, to John Chatillon & Sons, Inc. Platform scale for weighing a mass independently of the relative position of the mass on the platform. 3,889,768, Cl. 177-229.000.

Helms, Charles Robert, to Container Corporation of America. Sterile package. 3,889,808, Cl. 206-364.000.

Helms, Horace H., Jr.; and Rosner, Alexander G. Pyrotechnic composition. 3,890,174, Cl. 149-44.000.

Helsingborgs Spikfabriks AB: *See*—
Danielson, Claes Otto Sigfrid; Andersson, Claes-Goran Staffan; and Gram, Hans-Ake Christian, 3,889,450.

Hemming, Harold George: *See*—
Broadbent, Douglas; Burrows, Brian Frederick; Carter, Stephen Barnaby; and Hemming, Harold George, 3,890,435.

Hendrix, Donald E.; Ziegler, Richard E.; and Swinson, Weldon E., to United States of America, Energy Research and Development Administration. Blade transition for axial-flow compressors and the like. 3,890,062, Cl. 416-234.000.

Henkler, Herbert, to BASF Aktiengesellschaft. Arrangement for exposing photosensitive materials with information displayed on the screen of a cathode ray tube. 3,890,041, Cl. 355-18.000.

Henneberg, Val G., to Petro-Tex Chemical Corporation. Extractive distillation with furfurol and acyclic ketone cosolvent. 3,890,208, Cl. 203-58.000.

Henning, Klaus: *See*—
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Henrick, Clive A.; and Siddall, John B., to Zoecon Corporation. Aliphatic tri-olefinic halides. 3,890,398, Cl. 260-653.300.

Henson, William P., to Mobile Drilling Company Inc. Earth sampling apparatus. 3,889,765, Cl. 175-257.000.

Herbenar, Edward J.; and Mazur, Sylvester S., to TRW Inc. Wear indicating joint assembly. 3,890,052, Cl. 403-27.000.

Herbert, Hugh Grahame. Wheeled vehicles. 3,889,770, Cl. 180-14.00R.

Hercules Incorporated: *See*—
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Herryman, Rafael Marcelo. Book holder and separator. 3,889,816, Cl. 211-43.000.

Hess, Garry Carson: *See*—
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Hess, Hans-Jurgen Ernst: *See*—
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Hess, Peter: *See*—
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Heuser, Gordon D.; and Pennell, Rolla J. Ambulatory traction treatment apparatus. 3,889,664, Cl. 128-75.000.

Hewitt, John Kent, to Hewitt, John Kent. Pressurized automotive sanding device. 3,889,991, Cl. 291-1.000.

Hewlett Packard Company: *See*—
Brewster, John L., 3,890,503.

Hexcel Corporation: *See*—
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Heyne, Anton, to Siemens Electrogerate GmbH. Pulley drive for a side-loaded drum type washing machine. 3,889,496, Cl. 68-140.000.

Hi-G Incorporated: *See—*
Blanchenot, John P., 3,890,028.

Hilby, Noel Evan, to Boeing Company, The. Airfoil leading edge structure with boundary layer control. 3,889,903, Cl. 244-42.0CC.

Hildebrand, Clinton L. Vehicle door operator. 3,889,420, Cl. 49-302.000.

Hill, James A.; and Keefer, George E., to Owens-Illinois, Inc. Recuperator structures and method of making same. 3,889,744, Cl. 165-83.000.

Hill, Monty; and Uthene, Curtis, to Zenith Radio Corporation. Dry, impulse-resistant implosion protection system for large screen cathode ray tubes. 3,890,464, Cl. 178-7.800.

Himeno, Shohachi, to Conde Kabushiki Kaisha. Knife for cutting in sliding contact with ruler edge. 3,889,368, Cl. 30-162.000.

Hinata, Masanao: *See—*
Ohkubo, Kinji; Noguchi, Junpei; Ohmura, Kunioki; and Hinata, Masanao, 3,890,154.

Hinckley, Grayson W.; and Ikeda, George, to Pax Systems, Inc. Refrigeration system for air cargo containers. 3,889,486, Cl. 62-62.000.

Hinton, Dreama B.: *See—*
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Hirai, Akira. Means for opening tubular net cut end for net bag packaging. 3,889,453, Cl. 53-390.000.

Hirai, Tadaaki; Maruyama, Eiichi; Inao, Kiyohisa; Yamamoto, Hideaki; Goto, Naohiro; Isozaki, Yukinao; Shidara, Keiichi; and Uchida, Teruo, to Hitachi, Ltd.; and Nippon Hoso Kyokai. Photoconductive target of an image pickup tube comprising graded selenium-tellurium layer. 3,890,525, Cl. 313-386.000.

Hirai, Yoshiyuki: *See—*
Takeshita, Yasuhiro; Uoi, Michitake; Hirai, Yoshiyuki; and Uchiyama, Mitsuru, 3,890,253.

Hirao, Toshiro, to Meidensha Electric Mfg. Co., Ltd. Low pressure operable, diaphragm type logical element. 3,889,711, Cl. 137-599.000.

Hirata, Kazushi: *See—*
Oishi, Ryota; Mito, Yotaka; Yamauchi, Kenji; Takahashi, Katsuyuki; and Hirata, Kazushi, 3,890,433.

Hirose, Kimiharu: *See—*
Kazaoka, Kenichi; Hirose, Kimiharu; Takeshita, Yasuo; Matsumoto, Hisao; and Okamoto, Kazuo, 3,889,971.

Hirschberg, Walter Ivar, to Elektriska Svetsningsaktiebolaget. Method and apparatus for manufacture of floor gratings. 3,889,345, Cl. 29-412.000.

Hirschman, Paul S.: *See—*
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Hiscutt, Robert: *See—*
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Hirai, Tadaaki; Maruyama, Eiichi; Inao, Kiyohisa; Yamamoto, Hideaki; Goto, Naohiro; Isozaki, Yukinao; Shidara, Keiichi; and Uchida, Teruo, 3,890,525.
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Hitomi, Nobuteru: *See—*
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Hivert, Andre R.; and Galmiche, Philippe M., to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.). Processes for the manufacture of tungsten-based alloys and in the corresponding materials. 3,890,145, Cl. 75-224.000.

Hix, Donald E.; and Dyer, Robert S. Anti-theft device for outboard motors. 3,889,500, Cl. 70-232.000.

Hjermstad, Hans Petter: *See—*
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Hlavaty, Robert J.: *See—*
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Hochberg, David L., to Pitney-Bowes, Inc. Toner compositions and methods for their preparation. 3,890,240, Cl. 252-62.100.

Hockenberry, Jack: *See—*
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Hockin, Harry William, to Western Titanium N.L. Reduction of iron-containing ores. 3,890,138, Cl. 75-33.000.

Hodges, Ronald R.: *See—*
Mohr, Robert G.; Hodges, Ronald R.; Hockenberry, Jack; Scheerhorn, Douglas; and Wilcox, Gale F., 3,890,023.

Hoechst Aktiengesellschaft: *See—*
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Hofer, Wolfgang; Schliebs, Reinhard; Schmidt, Robert Rudolf; and Eue, Ludwig, to Bayer Aktiengesellschaft. N-substituted (2-chloroethyl) phosphoramide chloride. 3,890,382, Cl. 260-543.00P.

Hoffmann-La Roche Inc.: *See—*
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Ember, George, 3,890,392.

Hofland, Petrus Cornelius Gerardus. Methods of stitching a seam. 3,889,613, Cl. 112-121.150.

Hogg, Walter R., to Coulter Electronics, Inc. Particle study device. 3,890,569, Cl. 324-71.0CP.

Hogg, Walter R.: *See—*
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Hokama, Takeo, to Velsicol Chemical Corporation. N,N-bis(2-methoxy-3,6-dichlorobenzoyloxyalkyl)anilines. 3,890,373, Cl. 260-473.00R.

Holbrook, Legrand K., to Medical Development Corporation. Mold structure for fabricating fluid collection receptacles. 3,889,920, Cl. 249-151.000.

Holder, Charles B.: *See—*
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Holly, Robert: *See—*
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Holman, John A. Apparatus for manufacturing artificial boards and shapes. 3,890,077, Cl. 425-111.000.

Holmes, Floyd W. Control system for periodically feeding nutrient solutions to hydroponic plant beds. 3,889,415, Cl. 47-1.200.

Holstein & Kappert Maschinenfabrik Phonix GmbH: *See—*
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Hooks, Haywood, Jr.: *See—*
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Hoover Company, The: *See—*
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Hori, Toshio. Disc brake unit. 3,889,785, Cl. 188-73.300.

Horlein, Gerhard; Studeneer, Adolf; Langeluddeke, Peter; and Schwerdtle, Friedhelm, to Hoechst Aktiengesellschaft. 2-Haloalkylhaloalkylsulfonylbenzimidazoles. 3,890,344, Cl. 260-309.200.

Horowitz, Robert M.; and Gentili, Bruno, to United States of America, Agriculture. Dihydrochalcone galactosides and their use as sweetening agents. 3,890,296, Cl. 260-210.00F.

Horowitz, Robert M.; and Gentili, Bruno, to United States of America, Agriculture. Dihydrochalcone xylosides and their use as sweetening agents. 3,890,298, Cl. 260-210.00F.

Horowitz, Victor, to Current Industries, Inc. Lighting control system. 3,890,534, Cl. 315-92.000.

Horstman, Anton J., to Bauer Bros. Co., The. Refiner disc. 3,889,890, Cl. 241-245.000.

Horton Manufacturing Co., Inc.: *See—*
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Horwitz, Don A. Method of repairing a worn ball on the yoke of an universal joint assembly. 3,889,346, Cl. 29-401.000.

Hosaka, Akio; Baba, Kosaku; and Wazawa, Kiyoshi, to Nissan Motor Company Limited. Operation recorder for motor vehicle safety device. 3,890,594, Cl. 340-52.00H.

Hosaka, Hideo, to Max Kabushiki Kaisha. Binder. 3,889,338, Cl. 29-243.560.

Hoswell, Vicki Lorraine: *See—*
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Houdret, Charles; and Marchand, Jacques, to Pneumatiques, Caoutchouc Manufacture and Plastiques Kleber-Colombes. Production of v-type transmission belts. 3,889,546, Cl. 74-234.000.

Hounshell, Robert F.: *See—*
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Howell Laboratories, Inc.: *See—*
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Howes, Leslie D. Combination grease centrifugal separator and flame trap. 3,890,124, Cl. 55-346.000.

Howson-Algraphy Limited: *See—*
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Hoyer, Sigurd, to Potter Instrument Co., Inc. Compact magnetic tape drive with overlapping tape reels lying in different planes. 3,889,901, Cl. 242-209.000.
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Hruby, John O., Jr., to Rain Jet Corporation. Floating fountain. 3,889,880, Cl. 239-18.000.
Huang, Ho-Chung, to RCA Corporation. Impatt diode. 3,890,630, Cl. 357-13.000.
Huchette, Michel; and Fleche, Guy, to Roquette Freres. Starch hydrolysate methods for its preparation and products based thereon. 3,890,300, Cl. 260-233.30R.
Huck, Neil F.: *See—*
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Hudson, George. Energy metering circuits for capacitor discharge and other ignition systems. 3,889,651, Cl. 123-148.00E.
Hueck and Cie: *See—*
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Huffman, Herman M.; Swanson, Kenneth B.; and Jensen, Kenneth D., to Midland-Ross Corporation. Accumulator arrangement for a booster brake mechanism. 3,889,467, Cl. 60-548.000.
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Hull, Otis E., to Hexcel Corporation. Box beam fabrication process. 3,890,415, Cl. 264-46.700.
Hull, Thomas Neil, Jr.; Nye, James Leroy; and Steyer, William, to General Electric Company. Retractable sound suppressor for a gas turbine engine. 3,889,882, Cl. 239-127.300.
Hulthen, Martin Henry, to Aktiebolaget Henry Hulthen. Cloth weight. 3,889,313, Cl. 16-1.000.
Hummel, Thomas. Easy off wheel retainer. 3,890,009, Cl. 301-9.0DN.
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Hurd, Leslie A. Method and apparatus for outdoor position locating including development of an area map by relative bearings of visible landmarks. 3,889,386, Cl. 33-228.000.
Hurley, Joseph John: *See—*
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Huss, Heinrich. Device for developing photographic film or paper. 3,890,629, Cl. 354-299.000.
Husted, Paul R.; and Galan, Felix. Micrometer tooth measuring apparatus. 3,889,382, Cl. 33-179.000.
Hutchison, Robert B.; and Mores, Lee R., to Emery Industries, Inc. Polyglycerol partial esters and their use in lipstick formulations. 3,890,358, Cl. 260-410.600.
Hutchison, Stanley O., to Chevron Research Company. Inflatable packer. 3,889,749, Cl. 166-187.000.
Hutter, Rudolf G. E.; and Dressel, Herman O., to GTE Laboratories Incorporated. Compound electrostatic lens system. 3,890,529, Cl. 313-460.000.
Hwa, Chih Ming; Cuisia, Dionisio Guerrero; and Gray, John Allen, to Chemed Corporation. Polyacrylate-polyphosphonic acid treatment in aqueous systems. 3,890,228, Cl. 210-58.000.
Hyde, Gene A.: *See—*
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Hydramet American Inc.: *See—*
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I-T-E Imperial Corporation: *See—*
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Ichikawa, Junji, to Canon Kabushiki Kaisha. Exposure device for transmitting light waves modulated to contain information. 3,890,038, Cl. 355-1.000.
Ichiko Industries Limited: *See—*
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Ichiryu, Ken; Shigeta, Masayuki; and Kajiwara, Toshiyuki, to Hitachi, Ltd. Thickness control device for rolling mill. 3,889,504, Cl. 72-8.000.
Ichiyanagi, Toshikazu: *See—*
Izumi, Hideo; and Ichiyanagi, Toshikazu, 3,890,550.
ICI United States Inc.: *See—*
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Baily, Everett M.; Rathbone, Donald E.; and Johnson, Lynn F., 3,889,796.
Idemitsu Kosan Co. Ltd.: *See—*
Takeshita, Yasuhiro; Uoi, Michitake; Hirai, Yoshiyuki; and Uchiyama, Mitsuru, 3,890,253.
Ihle, Josef, to Ungerer, Irma. Process and an apparatus for regulating the drive or deceleration of power driven or decelerated rollers in drawing and straightening installations. 3,889,505, Cl. 72-17.000.
Iizuka, Masabumi: *See—*
Kojima, Takeshima; Iizuka, Masabumi; Kabayama, Kenta; and Izawa, Shizuhiro, 3,890,616.
Ikai, Kunio: *See—*
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Ikeda, George: *See—*
Hinckley, Grayson W.; and Ikeda, George, 3,889,486.
Ikeda, Shojiro: *See—*
Nishi, Sunao; Ikeda, Shojiro; and Kawazoe, Asao, 3,889,354.
Ikegami, Yoshizo; and Yamanouchi, Kenzo, to Konan Camera Research Institute. System for use in the supervision of a motor-boat race or a similar timed event. 3,890,463, Cl. 178-6.800.
Ilagan, Perlita A.: *See—*
Bohme, Reinhard D.; and Ilagan, Perlita A., 3,890,292.
Illinois Tool Works Inc.: *See—*
Koscik, Richard A., 3,889,909.
Koscik, Richard Allen, 3,889,320.
Ilukowicz, Robert John, to Preco Industries, Ltd. Plastic threaded insert for forming voids in concrete products. 3,889,916, Cl. 249-59.000.
Imazeki, Kazuyoshi: *See—*
Nakano, Masao; and Imazeki, Kazuyoshi, 3,890,574.
Imperial Chemical Industries Limited: *See—*
Broadbent, Douglas; Burrows, Brian Frederick; Carter, Stephen Barnaby; and Hemming, Harold George, 3,890,435.
George, Edwin Francis; and Davidson, Alan John, 3,890,130.
Jones, David Colin, 3,890,365.
Kenyon, Derek; and Wilson, Donald James, 3,889,457.
Vallance, Christopher, 3,890,417.
Imral, Sadik S., to Intertherm, Inc. Sheet metal "Y" adaptor for ducts. 3,889,987, Cl. 285-155.000.
Inaba, Shigeho: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Sasajima, Kikuo; Nakao, Masaru; Maruyama, Isamu; Ono, Keiichi; and Katayama, Shigenari, 3,890,323.
Inao, Kiyohisa: *See—*
Hirai, Tadaaki; Maruyama, Eiichi; Inao, Kiyohisa; Yamamoto, Hideaki; Goto, Naohiro; Isozaki, Yukinao; Shidara, Keiichi; and Uchida, Teruo, 3,890,525.
Incando, Peter Anthony. Hair piece and method and apparatus for making same. 3,889,695, Cl. 132-53.000.
Indian Head Inc.: *See—*
Frische, Dale George, 3,889,800.
Industrial Nucleonics Corporation: *See—*
Straumanis, Maris A., 3,890,078.
Industrie Pirelli Societa per Azioni: *See—*
Portinari, Antonio; and Alimenti, Giovanni, 3,889,455.
Industrie-Werke Karlsruhe Augsburg AG: *See—*
Vorgrimler, Ludwig; and Hupp, Gerhard, 3,889,572.
Ing. C. Olivetti & C., S.p.A.: *See—*
Garberi, Sergio; and Bertino, Lorenzo, 3,889,795.
Ingrip Fasteners Inc.: *See—*
Brumlik, George C., 3,889,322.
Insolio, Thomas A.; Kozyrski, Vincent T.; and Witkoski, Edward J., to Fletcher-Terry Company, The. Apparatus for cutting glass and plastic sheet. 3,889,862, Cl. 225-96.500.
Institut Francais du Petrole, des Carburants et Lubrifiants: *See—*
Breelle, Yves; Grehier, Alain; and Paty, Marcel, 3,890,076.
Castela, Andre; and Joubert, Philippe, 3,889,466.
Lagrange, Yvon; Martino, Germain; and Lassau, Christian, 3,890,400.
Institutt for Atomenergi: *See—*
Berg, Ronald; Hjermstad, Hans Petter; and Neefjes, Gerard Albert, 3,890,245.
Intercontinental Dynamics Corporation: *See—*
Argentieri, Michael; and Kelso, Robert, 3,890,614.
International Business Machines Corporation: *See—*
Aronstein, Jesse; and Harding, William E., 3,889,355.
Ballas, Donald F.; Ku, San-Mei; and Marinace, John C., 3,890,455.
Brunner, Rolf H.; and Lester, William C., 3,889,632.
Desblanche, Andre Eugene; and Pierret, Jean Marc, 3,890,572.
Fisk, Dale Edward; and Homan, Merle Edward, 3,890,472.
Haas, Lee C.; and West, Lynn Parker, 3,890,460.
Jones, John W.; Sears, John F.; and Taylor, Keith G., 3,890,603.
Raczek, Thaddeus A., 3,890,418.
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International Harvester Company: *See—*
O'Toole, Peter J., 3,890,012.
International Nickel Company of Canada, Ltd., The: *See—*
Jaquay, Louis Harold, 3,889,933.
International Paper Company: *See—*
Lee, Charles A.; and Furbeck, Warren R., 3,890,195.
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International Video Corporation: *See—*
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Mo, Frank S. C.; and Natwick, Vernon R., 3,890,641.
Intertherm, Inc.: *See—*
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Iobal, Abul Fateh Mohammed, to Monsanto Company. Process for the preparation of N-arylphthalimidines. 3,890,346, Cl. 260-325.0PH.
Ireco Chemicals: *See—*
Jessop, Harvey A., 3,890,171.
Irvin, Dee L.: *See—*
Tobey, Hubert E.; Hood, John W.; and Irvin, Dee L., 3,889,548.

Irvine, James M.: *See—*
Silverman, Ira; and Irvine, James M., 3,889,893.

Isaac, Eirlys R.; and Kirby, Peter, to Shell Oil Company. Dioxolanyl carbonyl carboxamides. 3,890,352, Cl. 260-340.900.

Ishida, Hiroshi: *See—*
Yoshitake, Norito; Usami, Hiroshi; Kobari, Katsuo; Ishida, Hiroshi; and Fujioka, Yoshiki, 3,890,554.

Ishida, Yozo: *See—*
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Ishikawa, Kazuo: *See—*
Kanaya, Iwao; Ishikawa, Kazuo; and Mifune, Hideo, 3,890,588.

Ishimaru, Toshiyasu; and Kodama, Yutaka, to Toyama Chemical Co., Ltd.. Process for producing 7-acylamino-3-methyl-3-cephem-4-carboxylic acids. 3,890,314, Cl. 260-243.00C.

Isozaki, Yukinao: *See—*
Hirai, Tadaaki; Maruyama, Eiichi; Inao, Kiyohisa; Yamamoto, Hideaki; Goto, Naohiro; Isozaki, Yukinao; Shidara, Keiichi; and Uchida, Teruo, 3,890,525.

Isupova, Tamara Ivanovna: *See—*
Fain, Pavel Ioelievich; Zimin, Vladimir Anatolievich; Strashun, Aron Zakharovich; Isupova, Tamara Ivanovna; Pankratov, Alexandr Ivanovich; and Romanov, Georgy Ivanovich, 3,890,457.

Ito, Senji, to Toyo Seikan Kaisha Limited. Heatable package of food. 3,890,448, Cl. 426-126.000.

Ito, Shunji; Morioka, Yasuaki; Kajinaga, Yoshihiro; Nitta, Minoru; and Sakurada, Ichio, to Kawasaki Steel Corporation. Raw powders to be used for production of low alloys steels having an excellent hardenability by powder metallurgy. 3,890,136, Cl. 75-0.5BA.

IU Conversion Systems, Inc.: *See—*
Cotts, Ronald F., 3,890,080.

Iwabuchi, Yoshiki: *See—*
Suzuki, Fumio; Hayashi, Mamoru; Kawakami, Ikuo; Motohashi, Fujio; and Iwabuchi, Yoshiki, 3,890,336.

Iwanami, Teruo: *See—*
Fukushima, Mitio; and Iwanami, Teruo, 3,890,267.

Iwasaki, Yasuhiro; Shiota, Hiroshi; and Seko, Seido, to Mitsubishi Jukogyo Kabushiki Kaisha. Apparatus for bending a steel plate. 3,889,513, Cl. 72-385.000.

Iwata, Hiroshi, to West Electric Company, Ltd. Electronic flash device for photography. 3,890,536, Cl. 315-151.000.

Iwata, Hiroshi; Sawada, Yasunori; and Yamaoka, Tetsuo, to West Electric Company, Ltd. Photographic electronic flash apparatus. 3,890,538, Cl. 315-241.00P.

Izawa, Shizuhiro: *See—*
Kojima, Takeshima; Iizuka, Masabumi; Kabayama, Kenta; and Izawa, Shizuhiro, 3,890,616.

Izraeli, Hyman, to Thomas & Betts Corporation. Partitioned electrical connector. 3,890,029, Cl. 339-98.000.

Izumi, Hideo; and Ichiyanagi, Toshikazu, to Canon Kabushiki Kaisha. Differential amplifier circuit for servo system. 3,890,550, Cl. 318-678.000.

J. I. Case Company: *See—*
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J. & P. Coats, Limited: *See—*
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J. W. Greer, Inc.: *See—*
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Jackes-Evans Manufacturing Company: *See—*
Harrell, Bob G., 3,889,498.

Jackson, Crowell B. Disposable fireplace and oven lighter. 3,890,087, Cl. 431-277.000.

Jackson, Ira J.; O'Connor, Thomas F.; and Buckley, James H., to Trans-World Compacters, Inc. Container adapter for refuse compactor. 3,889,589, Cl. 100-218.000.

Jackson, John G., to Du Charme, Leon, a part interest. Well drilling method and apparatus. 3,889,764, Cl. 175-69.000.

Jaffa, David, to Precision Screen Machines Inc. Continuous rotary screen printing method and apparatus. 3,889,595, Cl. 101-116.000.

Jagenberg Werke AG: *See—*
Strack, Hans Josef, 3,889,846.

Jager, Horst, to Ciba-Geigy AG. Process for the manufacture of perfluoroalkyl esters. 3,890,376, Cl. 260-485.00F.

Jahn, Alfred, to Siemens Aktiengesellschaft. Method of machining printed-circuit boards and/or working patterns for such printed-circuit boards. 3,889,383, Cl. 33-180.00R.

Jakimowicz, Christopher C., to National Steel Corporation. Static gas pressure measuring device. 3,889,521, Cl. 73-38.000.

Jakob, Hans, to Maschinenfabrik Goebel GmbH. Device for adjustment of oscillation amplitude on zigzag folding apparatus. 3,889,940, Cl. 270-61.00F.

James Burn Bindings Limited: *See—*
Adams, Sidney George William; and Galliford, Edgar Horace, 3,889,309.

James, Daniel Shaw, to du Pont de Nemours, E. I., and Company. Yellow to orange disazo cationic dyes containing two quaternary ammonium groups. 3,890,257, Cl. 260-148.000.

Jamieson, Norman C., to Mallinckrodt, Inc. Method for N,N-dicyanoethylating aminophenols. 3,890,368, Cl. 260-465.00E.

Japan Antibiotics Research Association: *See—*
Miyamura, Sadao; Ogasawara, Nagahiro; and Otsuka, Hitoshi, 3,890,199.

Japanese National Railways: *See—*
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Jaquay, Louis Harold, to International Nickel Company of Canada, Ltd., The; and Dravo Corporation. Metallurgical lance. 3,889,933, Cl. 266-34.00L.

Jarboe, Theodore Lee; and Groseclose, Connie Dean. Protective wearing apparel. 3,889,297, Cl. 2-16.000.

Jarleborg, Olle: *See—*
Skoglund, Eric; and Jarleborg, Olle, 3,890,143.

Jarvis, Lactance A.; and Nimtz, Ronald L., to Clark Equipment Company. Rolling apparatus. 3,889,618, Cl. 113-55.000.

Jayawant, Madhusudan D., to du Pont de Nemours, E. I., and Company. Decolorization of ammonium thiosulfate. 3,890,428, Cl. 423-264.000.

Jean Walterscheid GmbH: *See—*
Geisthoff, Hubert, 3,889,980.

Jeger, Oskar; Wolf, Hans; and Zink, Markus, to Ciba-Geigy Corporation. Process for the photocyclization of the dihydro-ionones and their homologues, and the products obtainable by this process. 3,890,395, Cl. 260-617.00F.

Jegousse, Michel: *See—*
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Jensen, Bliss D.: *See—*
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Jensen, Kenneth D.: *See—*
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Jeong, David Hoy, to Addington Laboratories, Inc. Floating-ground microwave ferrite isolators. 3,890,582, Cl. 333-24.200.

Jessop, Harvey A., to Ireco Chemicals. Explosive compositions containing guar gum derivative. 3,890,171, Cl. 149-19.100.

Jesswein, Ronald M., to Clark Equipment Company. Tractor unit for an articulated vehicle. 3,889,976, Cl. 280-400.000.

John Chatillon & Sons, Inc.: *See—*
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John Graves and Associates Incorporated: *See—*
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John Ott Laboratories, Inc.: *See—*
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Johnson, Lynn F.: *See—*
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Johnson, Marlyn D.: *See—*
Bruckner, Arnold D.; and Johnson, Marlyn D., 3,889,868.

Johnson, Paul R., to Harsco Corporation. Automatic scum removal trough. 3,890,289, Cl. 210-104.000.

Johnson, Thomas J., to Celestron Pacific. Method for making schmidt corrector lenses. 3,889,431, Cl. 51-284.000.

Johnson, Wayne F.: *See—*
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Johnston, John O.: *See—*
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Johnston, Richard D.: *See—*
Harmon, James F.; Johnston, Richard D.; Lach, John H.; Von Der Lieth, William H.; and Murphy, Thomas L., 3,890,453.

Johnstone, Charles Wilkin, to Schlumberger Technology Corporation. Neutron logging reliability techniques and apparatus. 3,890,501, Cl. 250-265.000.

Joly, Francois: *See—*
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Joly, Jean; and Sangalli, Silvio, to Rhone-Poulenc-Textile. Method for interlacing strands of a textile yarn. 3,889,327, Cl. 28-72.120.

Jonassen, Gaylord D., to Telecommunications Industries, Inc. Low voltage surge protection network. 3,890,543, Cl. 317-16.000.

Jones, Chester L. M.; Yoakam, Raymond J.; Hazar, Mitchell M.; and Dillon, Alfred J. Means and method for servicing fluid cushioned aircraft landing gear struts. 3,889,904, Cl. 244-104.00R.

Jones, Christopher Robin: *See—*
Williams, Malcolm; Brunt, Geoffrey Albert Kenyon; and Jones, Christopher Robin, 3,889,648.

Jones, David Colin, to Imperial Chemical Industries Limited. Organic reduction process. 3,890,365, Cl. 260-465.80A.

Jones, Frederick O., to Wilkinson Sword Limited. Razor blades having high purity Al_2O_3 coating. 3,890,109, Cl. 29-195.000.

Jones, Harold F.: *See—*
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Jones, John W.; Sears, John F.; and Taylor, Keith G., to International Business Machines Corporation. Associative store. 3,890,603, Cl. 340-173.0AM.

Jones, William F.: *See—*
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Jonkers, Cornelius O. Belt conveyor and method for operating such a conveyor. 3,889,802, Cl. 198-184.000.
Jordan, Harold V.; and Van Houte, Johannes, to Forsyth Dental Infirmary for Children. Selective medium for streptococcus mutans. 3,890,200, Cl. 195-103.50R.
Jordan, Heinz: *See—*
Rademacher, Friedrich; Quest, Karl; Knabe, Uwe; Unger, Dieter; Jordan, Heinz; Heckmann, Werner; and Plock, Karl, 3,889,725.
Joseph, Donald B., to Raymond Lee Organization, Inc., The. Smoke lamp drawing device. 3,890,126, Cl. 55-385.000.
Joseph Lucas (Electrical) Limited: *See—*
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Joseph Lucas (Industries) Limited: *See—*
Chafer, Henry James; and Graham, Stuart, 3,890,519.
Tombs, Terence Leslie, 3,890,518.
Joseph, Mark T., to Samsonite Corporation. Pack frame and sack therefor. 3,889,859, Cl. 224-8.00R.
Joubert, Philippe: *See—*
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Juarez, Jean: *See—*
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Juarez, Robert N.; Juarez, Jean; and Buford, Wesley E. Padding rack. 3,889,590, Cl. 100-219.000.
Julia, Marc: *See—*
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Jung, David H. Colorimetric assay for urea. 3,890,099, Cl. 23-230.00B.
Jurgens, Heinz; and Ostendorf, Heinrich, to Brown, Boveri & Cie AG. Device for transporting bars. 3,889,798, Cl. 198-127.000.
Justus, Edgar J.; and Roerig, Arnold J., to Beloit Corporation. Controlled deflection roll drive. 3,889,334, Cl. 29-115.000.
Kabayama, Kenta: *See—*
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Kabushiki Kaisha Suehiro Sharyo Seisakusho: *See—*
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Kain, Philip. Shampoo delivery assembly. 3,889,851, Cl. 222-146.0HS.
Kaizu, Yasuo, to Victor Company of Japan, Limited. Circuit arrangement for protection of a speaker system. 3,890,465, Cl. 179-1.0VL.
Kajinaga, Yoshihiro: *See—*
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Kakihara, Minoru, to Mitsui Shipbuilding & Engineering Co. Ltd. Stern tube bearing. 3,889,626, Cl. 115-34.00R.
Kallander, Charles A. Ergonomic drive for bicycles and other human powered machines. 3,889,974, Cl. 280-251.000.
Kambara, Shu: *See—*
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Kamins, Jerome H.; Mandell, Michael I.; Armen, Harry, Jr.; and Savet, Paul. Beverage-heating device. 3,890,484, Cl. 219-432.000.
Kamman, Gordon W., to Houdaille Industries, Inc. Hydraulic buffer. 3,889,934, Cl. 267-34.000.
Kanamaru, Toshiji: *See—*
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Kanaya, Iwao; Ishikawa, Kazuo; and Mifune, Hideo, to Matsushita Electric Industrial Co., Ltd. Water jacket temperature sensor. 3,890,588, Cl. 338-28.000.
Kanegafuchi Boseki Kabushiki Kaisha: *See—*
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Kanetaka, Junichi; Mori, Shoichiro; and Kobayashi, Itaru, to Mitsubishi Petrochemical Company, Ltd. Production of gamma-butyrolactone. 3,890,361, Cl. 260-343.600.
Kaniecki, Thaddeus John, to Armour-Dial, Inc. Method and apparatus for producing striped soap bar. 3,890,419, Cl. 264-171.000.
Kanitz, Roy E., to Sperry Rand Corporation. Self-braking follower mechanism for card files and the like. 3,889,838, Cl. 220-22.300.
Kann, Jerry Albert. Removable gooseneck hitch. 3,889,978, Cl. 280-415.00B.
Kansas University Endowment Association: *See—*
Fox, Eugene J.; and McChesney, James D., 3,890,299.
Kapitanov, Nikolai Nikolaevich; Petrova, Natalya Petrovna; Milonov, Oleg Borisovich; and Dyachikhin, Anatoly Alexandrovich. Surgical apparatus for suturing soft tissues. 3,889,683, Cl. 128-305.000.
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Karpenko, Anatole N., to Anchor/Darling Valve Company. Valve stem operator. 3,889,924, Cl. 251-249.500.
Kashio, Toshio, to Casio Computer Co. Ltd. Electronic clock devices. 3,889,458, Cl. 58-4.00A.
Kaspar, Hans, to Neomat AG. Device for holding front wall or inside wall facings as well as inside or outside facings of a ceiling in a pre-set distance from a supporting wall respectively a ceiling. 3,889,439, Cl. 52-709.000.
Kasravi, Peter B. Flexible geodesic-type toys. 3,889,950, Cl. 273-58.00D.
Katayama, Shigenari: *See—*
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Kathawala, Faizulla G., to Sandoz, Inc. Indole-1 and indoline-1-carboxamides and thiocarboxamides. 3,890,348, Cl. 260-326.11R.
Katner, Allen S., to Eli Lilly and Company. 1H-Pyrazolo[4,3-]quinol-4(5H)-one-3-carboxylic acids. 3,890,324, Cl. 260-287.00R.
Katz, Otto; and Tischinger, Heinrich, to Ledermann & Co. Fast exchange clamping device for rotary tools. 3,889,333, Cl. 29-104.000.
Kaufman, Sydney M., to Ford Motor Company. Brazing metal alloys. 3,889,349, Cl. 228-173.000.
Kauranen, Herbert A.; and Schettl, Alvin J., to Kelvinator, Inc. Self-locking oven door hinge. 3,889,654, Cl. 126-194.000.
Kawakami, Ikuo: *See—*
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Kazaoka, Kenichi; Hirose, Kimiharu; Takeshita, Yasuo; Matsumoto, Hisao; and Okamoto, Kazuo, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Safety belt apparatus. 3,889,971, Cl. 280-150.0SB.
Keathley, Donald P., to ICI United States Inc. Sleeve valve arrangement. 3,889,703, Cl. 137-67.000.
Keck, Norman. Speed control device. 3,890,547, Cl. 318-6.000.
Keefer, George E.: *See—*
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Keller, John Ansley, to Heavy Light Mfg. Corp. Container means. 3,889,866, Cl. 229-22.000.
Kelley, Charles N., to Harold Schnair, Delta Quality. Tail pipe system. 3,889,772, Cl. 180-64.00A.
Kelly, Michael J.; and Pitroda, Satyan G., to GTE Automatic Electric Laboratories Incorporated. Time division switching system. 3,890,469, Cl. 179-15.0AT.
Kelsey-Hayes Company: *See—*
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Kendrick, Thomas C.; and Ward, Andrew H., to Dow Corning Corporation. Polyalphamethylstyrene-polydimethylsiloxane block copolymers suitable as blown films. 3,890,405, Cl. 260-827.000.
Kenyon, Derek; and Wilson, Donald James, to Imperial Chemical Industries Limited. Macrofilamentary yarns. 3,889,457, Cl. 57-140.00R.
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Keszler, Julius L. Process of making a bacon-like meat product of reduced fat content. 3,890,451, Cl. 426-264.000.
Ketterer, Marta Carlota; and Ketterer, Victor Garcia. Fluid discharge unit. 3,889,302, Cl. 4-110.000.
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Kieronski, John P.; and Keon, Richard F., to Whitin Machine Works, Incorporated. Flute suspension plate. 3,889,311, Cl. 15-306.00A.

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Kindelan, James J., to Overmyer Mould Company of Pennsylvania. Multi-station drill apparatus. 3,890,057, Cl. 408-43.000.

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Kinzel, Augustus B. Displaceable swimming pool cover. 3,889,303, Cl. 4-172.130.

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Kitamura, Sadafumi; and Kanamaru, Toshiji, to Matsushita Electric Industrial Co., Ltd. Contactless control system for volume control and power on-off control. 3,890,592, Cl. 340-15.000.

Kitrilakis, Sotiris, to Searle Cardio-Pulmonary Systems Inc. Spirometer. 3,8a9,660, Cl. 128-2.080.

Kivlen, John A., to Exxon Research and Engineering Company. Furnace over-pressure prevention. 3,889,877, Cl. 236-15.00C.

Kiyoura, Tadamitsu; Takahashi, Toru; and Kogure, Yasuo, to Mitsui Toatsu Chemicals Incorporated. Method for the preparation of dialkalioxydiacetate. 3,890,381, Cl. 260-531.00C.

Klabacka, Robert, to Diesel Truck Drivers Training School Inc. Golf ball target. 3,889,957, Cl. 273-182.00R.

Klare, Robert John, to du Pont de Nemours, E. I., and Company. Regenerated cellulose softener recovery method and apparatus. 3,889,390, Cl. 34-23.000.

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Kleveland, Sigbjorn, to Norsk Hydro A.S. Method and apparatus for mechanized smutting of electrolyzers. 3,890,214, Cl. 204-70.000.

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Knufflmann, Manfred; and Seidel, Ingo. Temperature compensated resistance measuring of an elongated electrical conductor. 3,890,567, Cl. 324-64.000.

Knupfer, Hans; and Schellhammer, Carl-Wolfgang, to Bayer Aktiengesellschaft. α-Aryl-b-(amino-phenyl)acrylonitriles with an O-dialkyl sulphamidoxy or sulfuric acid semi-ester group. 3,890,364, Cl. 260-456.00A.

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Kobayashi, Kyoji: *See—*
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Kokoszka, John G., to Dow Corning Corporation. Polish ingredient. 3,890,271, Cl. 260-46.50R.

Koller, Josef. Overhead ropeway crab for conveying loads. 3,889,819, Cl. 212-94.000.

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Konishi, Jinemon. Anti-pollution exhaust apparatus. 3,890,103, Cl. 23-284.000.

Konrad, Charles Edward, to General Electric Company. Pulse control system power circuit. 3,890,549, Cl. 318-246.000.

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Koscik, Richard Allen, to Illinois Tool Works Inc. Headliner/molding retainer and method of installing same. 3,889,320, Cl. 24-73.0PM.

Kosonocky, Walter Frank, to RCA Corporation. Charge-coupled circuits. 3,890,633, Cl. 357-24.000.

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Krawitt, Donald R., to Mount Sinai School of Medicine of the City University of New York. Method of determining the presence of calculi in body cavities. 3,889,656, Cl. 128-2.00R.
Krayer, Harry J., III, to Xerox Corporation. Platen transport for automatic document handler. 3,889,943, Cl. 271-4.000.
Krenzer, John, to Velsicol Chemical Corporation. 2-Alkyl-4-aryl-1,2,4-triazolidin-3-ones. 3,890,342, Cl. 260-308.00C.
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Kronogard, Sven Olof, to United Turbine AB and Co., Kommanditbolag. Universal gas turbine automotive engine. 3,889,771, Cl. 180-44.00R.
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Kugele, Thomas G.; and Bresser, Robert E., to Cincinnati Milacron Chemicals Inc. Alkyltin polysulfide thioester stabilized composition. 3,890,277, Cl. 260-45.75S.
Kuhle, Engelbert; Klauke, Erich; Hamburger, Brigitte; and Scheinpflug, Hans, to Bayer Aktiengesellschaft. N-(trihalomethylthio-carbamic acid oxime ester. 3,890,386, Cl. 260-566.0AC.
Kuhn, Harry A., Jr.; and Schendel, Donald D., Jr., to Motorola, Inc. Two phase oscillator. 3,890,580, Cl. 331-116.00R.
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Kuster, Karl H., to GTE Automatic Electric Laboratories Incorporated. Circuit for monitoring and controlling multiple power supplies. 3,890,559, Cl. 323-21.000.
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Lackey, Walter J., Jr.; and Sease, John D., to United States of America, Energy Research and Development Administration. Means for effecting fluidization in pyrolytic carbon coating processes. 3,889,631, Cl. 118-48.000.
LaClair, Louis Maynard; McWhirter, John Ruben; and Ross, William Lawrence, to Union Carbide Corporation. Integral circular wastewater treatment plant. 3,890,231, Cl. 210-199.000.
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Lagrange, Yvon; Martino, Germain; and Lassau, Christian, to Institut Francais du Petrole des Carburants et Lubrifiants. Process for selectively hydrogenating cyclic oligomers of butadiene. 3,890,400, Cl. 260-666.00A.
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Lebold, Steve. Hot and cold pack. 3,889,684, Cl. 128-402.000.
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Lee, Harold G.; and Peterson, Henry O., to Leupold & Stevens, Inc. Digital print and punch tape recorder having read-write memory. 3,890,488, Cl. 235-61.90A.
Legille, Edouard; and Mahr, Rene N., to S.A. des Anciens Etablissements Paul Wurth. Charge distribution chute. 3,889,791, Cl. 193-3.000.
Legris, Andre, to Societe d'Exploitation des Brevets OCLAUR. Pipe couplings. 3,889,989, Cl. 285-341.000.
Lehn, Jean-Marie; Schue, Francois; Boileau, Sylvie; Kaempf, Bernd; Cau, Alain Andre; Moinard, Jean Robert; and Raynal, Serge Fernand, to Societe Nationale des Poudres et Explosifs. Anionic polymerization. 3,890,278, Cl. 260-63.00R.
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Leitner, Kajetan. Screw-threaded fastening members. 3,889,733, Cl. 151-41.730.
Lejeune, Daniel, to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie. Wheel rim with trough accommodating balancing weight. 3,890,008, Cl. 301-5.00B.
Lemelson, Jerome H. Fiber reinforced composite material and method of making same. 3,889,348, Cl. 29-419.00R.

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Lilja, Lars Harry; and Ottoson, Charles Folke Sigvard. Arrangement in a pipe for enclosing insulation. 3,889,715, Cl. 138-117.000.
Limb, John Ormond; and Murphy, John Arthur, to Bell Telephone Laboratories, Incorporated. Speed and direction indicator for video systems. 3,890,462, Cl. 178-6.800.
Limmer, Bobby Lee: *See—*
Waller, Jack Douglas; Limmer, Bobby Lee; and Sandlin, Felix M., 3,889,681.
Lin, Chun-Cheng, to Chuan Chang Enterprise Corporation. Pinching type chopsticks with locking means. 3,889,995, Cl. 294-16.000.
Lin, Ruey Y.: *See—*
Economy, James; Frechette, Francis J.; Lin, Ruey Y.; and Wohrer, Luis C., 3,890,262.
Lin, Spencer B. T. Plastic bag having tightening band. 3,889,872, Cl. 229-63.000.
Lindner, Irmgard: *See—*
Obendorf, Werner; Lindner, Irmgard; Schwarzinger, Ernst; and Krieger, Josef, 3,890,318.
Lindsey, Albert E. Fishing gear carrier. 3,889,860, Cl. 224-45.00R.
Lindsey, L. E.; and Sammons, Herbert F., to Lindsey Manufacturing Company. Convertible conductor stringing assembly for power line use. 3,889,911, Cl. 248-228.000.
Lindsey Manufacturing Company: *See—*
Lindsey, L. E.; and Sammons, Herbert F., 3,889,911.
Ling, Robin Sydney Mackwood; and Lee, Alan John Clive, to National Research Development Corporation. Apparatus and method for pressurizing gap-filling cement to a concavely relieved site in a bone. 3,889,665, Cl. 128-92.00R.
Linhart, Georg, to Techn-Chemie Kessler & Co. GmbH. Reinforced flexible hoses and their manufacture. 3,889,716, Cl. 138-129.000.
Linton, A. Leon, to Southern Systems. Conveyor control means. 3,889,606, Cl. 104-172.00S.
Lippel, Bernard, to United States of America, Army. Differential scanner system. 3,890,499, Cl. 250-201.000.
Lipstein, Norman J., to General Electric Company. Acoustic duct with asymmetric acoustical treatment. 3,890,060, Cl. 415-119.000.
Little, Jane: *See—*
Boehringer, Wilfred E.; Little, Jane; Rothi, Robert D.; and Westlund, Charles G., 3,890,064.
Littler, Joseph; Taylor, Dennis Joseph; and Campbell, Kenneth James, to British Insulated Callender's Cables Limited. Overhead current supply equipment for electric railways. 3,889,788, Cl. 191-40.000.
Litton Business Systems, Inc.: *See—*
La Manna, Richard J.; and Jensen, Alan K., 3,890,645.
Litton Industrial Products, Inc.: *See—*
Grundmann, Volker R., 3,890,081.
Livingston, Richard Donnan, to du Pont de Nemours, E. I., and Company. Method of drawing yarn using a plurality of separator rolls with each driven roll. 3,890,422, Cl. 264-290.00R.
Lo, Lian-Sheng: *See—*
Sun, Jun-Kai; and Lo, Lian-Sheng, 3,889,547.
Lobbe, Armin; and Von Schenck Zu Schweinsberg, Wolf-Rudiger, to Gewerkschaft Eisenhutte Westfalia. Process of, and a plant for, constructing tunnels. 3,889,480, Cl. 61-85.000.
Loeffler, Robert L.; and Winsor, Ronald D., to Package-King, Inc. Apparatus for preloading a tray and transferring the preloaded material to a sealing fixture for heat sealing. 3,889,452, Cl. 53-390.000.
Lofquist, Robert Alden: *See—*
Bingham, Alex John; Haylock, John Christopher; and Lofquist, Robert Alden, 3,890,286.
Lohr, Delmar F., Jr.; Fieldhouse, John William; and Kay, Edward Leo, to Firestone Tire & Rubber Company, The. Stabilized polybutadiene resins. 3,890,260, Cl. 260-23.70R.
Lollis, Glendon R.; and Lucke, Leroy C. Draft gear handling carriage. 3,889,604, Cl. 104-32.00R.
Loren, Jan, to Soderberg Tollam AB. Bathing device for invalided persons. 3,889,304, Cl. 4-185.00L.
Lorenzen, Uwe J.; and Martens, Harald, to Schmalbach-Lubeca GmbH. Apparatus for forming tubular bodies having longitudinal side seams. 3,889,617, Cl. 113-8.000.
Louthan, Rector P., to Phillips Petroleum Company. Mercaptoalkyltrialkoxysilane production. 3,890,213, Cl. 204-158.000.
Love, Richard F.: *See—*
Rubin, Isaac D.; Love, Richard F.; and Holder, Charles B., 3,890,357.
Loveland, Steven R.; and Campbell, Roy L. Non-invasive hyperbaric ventilator. 3,889,670, Cl. 128-204.000.
Loynachan, William David: *See—*
Obadal, Richard Dick; and Loynachan, William David, 3,889,717.
Lu, Sun. Electronic timepiece and method of making the same. 3,889,459, Cl. 58-23.0AC.
Lucas Electrical Company Limited, The: *See—*
Bryant, Walter Kenneth, 3,890,031.
Widdowson, Neville Bruce; and Cullingford, Christopher Varndell, 3,890,516.
Lucke, Leroy C.: *See—*
Lollis, Glendon R.; and Lucke, Leroy C., 3,889,604.
Luenser, Kurt K., to Verson Allsteel Press Company. Safety indicator system and method for metal forming machines. 3,889,503, Cl. 72-6.000.
Lupkas, Raymond R.; Freeman, Gerald C.; and Check, Frank T., Jr., to Pitney-Bowes, Inc. Computer responsive supplemental printer. 3,889,592, Cl. 101-93.470.
Lurie, George R.: *See—*
Stevens, Peter; and Lurie, George R., 3,890,210.
Luscher, Werner P., to Aerojet-General Corporation. Surface effects vehicle having variable geometry lift fan. 3,889,775, Cl. 180-118.000.
Lutes, Bill N. Digital electrocardiograph interpreter. 3,889,659, Cl. 128-2.06A.
Lutz, Michael A.; and Holly, Robert, to Hughes Aircraft Company. Continuous electron injector for crossed-field switch tubes. 3,890,520, Cl. 313-157.000.
Lyon, James E.: *See—*
Palm, Walter C.; and Lyon, James E., 3,889,935.
Mac-Fab Manufacturing, Inc.: *See—*
Morrow, A. Elmo, 3,889,585.
MacFadyen, Duncan Gardner. Sawing apparatus. 3,889,560, Cl. 83-4.000.
Mack, Eugene J.: *See—*
Pilie, Roland J.; and Mack, Eugene J., 3,889,532.
Mack Truck, Inc.: *See—*
Warmskessel, Terry L., 3,890,002.
MacKay, Patrick W.: *See—*
Celada, Juan; MacKay, Patrick W.; and de la Pena, Ramon, 3,889,864.
Celada, Juan; and MacKay, Patrick W., 3,890,142.
Mackintosh, Charles. Hinged seat bottom construction. 3,889,999, Cl. 297-248.000.
MacLeay, Ronald Edward: *See—*
Sheppard, Chester Stephen; and MacLeay, Ronald Edward, 3,890,294.
Madet, Francois. Helicopter comprising a plurality of lifting rotors and at least one propelling unit. 3,889,902, Cl. 244-17.230.
Madueno, Jesus Perez: *See—*
Nicolay, Karl; Buschmann, Karl; and Madueno, Jesus Perez, 3,889,614.
Maeda, Hiroyuki; and Matsuda, Takuma, to Osaka Gas Kabushiki Kaisha. Refrigerating apparatus. 3,889,488, Cl. 62-218.000.
Magnani, Arthur, to SmithKline Corporation. 3-Substituted-5-hydroxy (mercapto) alkylidene-rhodanine derivatives. 3,890,331, Cl. 260-294.80D.
Mahr, Rene N.: *See—*
Legille, Edouard; and Mahr, Rene N., 3,889,791.
Maistrelli, Roger: *See—*
Pruvot, Francois C.; Maistrelli, Roger; and Buachet, Pierre, 3,890,360.
Malavazos, administrator, by Gregory A.: *See—*
Malavazos, Arthur J., deceased; Malavazos, administrator, by Gregory A.; and Urdal, Jan, 3,890,491.
Malavazos, Arthur J., deceased; Malavazos, administrator, by Gregory A.; and Urdal, Jan, to A J M Research Corporation. Arithmetic unit for a postage meter. 3,890,491, Cl. 235-101.000.
Malcolm, Donald B., to Dravo Corporation. Method of and apparatus for drying particulate minerals for agglomeration. 3,889,391, Cl. 34-33.000.
Malec, Robert E., to Ethyl Corporation. Oil additive. 3,890,363, Cl. 260-455.00A.
Maleck, Leroy Robert, to Admiral Corporation. Two-way opening door for household refrigerator. 3,889,419, Cl. 49-193.000.
Malisow, Jack T., to Research & Development. Board game apparatus. 3,889,954, Cl. 273-134.00C.
Mallen-Herrero, Jose: *See—*
Fehr, Henri; and Mallen-Herrero, Jose, 3,890,515.
Mallinckrodt, Inc.: *See—*
Jamieson, Norman C., 3,890,368.
Malmberg, Earl W.: *See—*
Dycus, Dale W.; Malmberg, Earl W.; and Wilchester, Harry L., 3,890,239.

Mandell, Michael I.: *See—*
Kamins, Jerome H.; Mandell, Michael I.; Armen, Harry, Jr.; and Savet, Paul, 3,890,484.

Manduley, Flavio M.; and Storace, Anthony, to Pitney-Bowes, Inc. Postage value determining and control circuit. 3,890,492, Cl. 235-151.330.

Manor, Gedalyahu, to Technion Research and Development Foundation, Ltd.; and Kipnis, Aharon. Combined smoother and roller-packer. 3,889,760, Cl. 172-175.000.

Marchand, Jacques: *See—*
Houdret, Charles; and Marchand, Jacques, 3,889,546.

Marinace, John C.: *See—*
Ballas, Donald F.; Ku, San-Mei; and Marinace, John C., 3,890,455.

Marion Health and Safety, Inc.: *See—*
Avery, Carl Frederick, 3,890,204.

Mark Products, Inc.: *See—*
Florian, Eugene F.; Haggard, Samuel E.; and Riley, Travis E., 3,890,606.

Mars, Inc.: *See—*
Willis, Frederick Gordon, 3,889,792.

Marsh, Jeffrey D.; and McPherson, Gregg K., to Kelsey-Hayes Company. Wheel speed sensor. 3,890,517, Cl. 310-168.000.

Marshall, Leonard, to C.A.V. Limited. Vehicle guidance. 3,889,478, Cl. 61-72.600.

Marshall, Winston S., to Eli Lilly and Company. 3-Substituted phenylalkanohydroxamic acids. 3,890,377, Cl. 260-500.50H.

Martens, Harald: *See—*
Lorenzen, Uwe J.; and Martens, Harald, 3,889,617.

Marti, Raymond; and Chanson, Olivier, to Patek Philippe S.A. Master clock with electronic memory. 3,889,461, Cl. 58-25.000.

Martin, Edwin M. Tear-away face mask subassembly for football helmets. 3,889,296, Cl. 2-9.000.

Martin, Eugene Ray, to Stauffer Chemical Company. Process for preparing aminofunctional polysiloxane polymers. 3,890,269, Cl. 260-46.50E.

Martin Marietta Aluminum, Inc.: *See—*
Anderson, Paul E., 3,889,836.

Martin, Paul S.: *See—*
Devol, George C.; and Martin, Paul S., 3,890,552.

Martin, Sarden B.: *See—*
Owings, Joe T.; and Martin, Sarden B., 3,889,718.

Martin Wells Pty. Ltd.: *See—*
Zingarelli, Dino, 3,890,037.

Martino, Germain: *See—*
Lagrange, Yvon; Martino, Germain; and Lassau, Christian, 3,890,400.

Martyny, William C.: *See—*
Hammer, Edward E.; and Martyny, William C., 3,890,530.

Maruyama, Eiichi: *See—*
Hirai, Tadaaki; Maruyama, Eiichi; Inao, Kiyohisa; Yamamoto, Hideaki; Goto, Naohiro; Isozaki, Yukinao; Shidara, Keiichi; and Uchida, Teruo, 3,890,525.

Maruyama, Isamu: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Sasajima, Kikuo; Nakao, Masaru; Maruyama, Isamu; Ono, Keiichi; and Katayama, Shigenari, 3,890,323.

Maschinenfabrik Goebel GmbH: *See—*
Jakob, Hans, 3,889,940.

Massey-Ferguson Inc.: *See—*
Dwyer, Robert M., 3,889,709.

Massey, Richard Gascoine: *See—*
Melling, William Gordon; Stevens, John; McLellan, Peter George; Smith, Brian Turton; Massey, Richard Gascoine; Knight, John Barrington; and Lang, Robert Nigel, 3,890,556.

Massiera, Roger: *See—*
Bocquillon, Francois; and Massiera, Roger, 3,890,591.

Masson Scott Thrissell Engineering Limited: *See—*
Wood, David, 3,889,824.

Mast, Oscar. Propulsion system. 3,889,543, Cl. 74-88.000.

Masuda, Katsutada: *See—*
Ochiai, Michihiko; Aki, Osami; Morimoto, Akira; Okada, Taiiti; and Masuda, Katsutada, 3,890,309.

Mathieu, Pierre: *See—*
Guyot, Gilbert; Mathieu, Pierre; Philippe, Andre; Grancher, Pierre; and Solinhac, Jean, 3,890,120.

Matocha, Charles K., to Aluminum Company of America. Homogeneous fusion system and method. 3,890,089, Cl. 432-11.000.

Matsuda, Takuma: *See—*
Maeda, Hiroyuki; and Matsuda, Takuma, 3,889,488.

Matsuda, Teruo: *See—*
Takagi, Kazumi; and Matsuda, Teruo, 3,890,404.

Matsukawa, Hiroharu; Miyamoto, Akio; and Watanabe, Akio, to Fuji Photo Film Co., Ltd. Desensitizer composition. 3,890,156, Cl. 106-19.000.

Matsumoto, Hisao: *See—*
Kazaoka, Kenichi; Hirose, Kimiharu; Takeshita, Yasuo; Matsumoto, Hisao; and Okamoto, Kazuo, 3,889,971.

Matsumoto, Kouichi: *See—*
Shoji, Jun'Ichi; Mayama, Mikao; Matsuura, Shinzo; Matsumoto, Kouichi; and Wakisaka, Yoshiharu, 3,890,436.

Matsunaga, Hiroomi; Okumura, Takuzo; Takata, Isao; and Saito, Teruo, to Sumitomo Chemical Co., Ltd. Modified polyphenylene oxides containing phosphoric acid ester-antimony trioxide flame retarding additives. 3,890,406, Cl. 260-874.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Kanaya, Iwao; Ishikawa, Kazuo; and Mifune, Hideo, 3,890,588.
Kitamura, Sadafumi; and Kanamaru, Toshiji, 3,890,592.
Nishida, Masamitsu; and Ouchi, Hiromu, 3,890,241.
Yabu, Toshiomi, 3,890,640.

Matsushita Electric Works, Ltd.: *See—*
Sakai, Satoshi; Shimizu, Norio; and Nomura, Junji, 3,889,372.
Tanaka, Hisayuki; Wada, Yukio; and Shiba, Seiichro, 3,889,693.

Matsuura, Shinzo: *See—*
Shoji, Jun'Ichi; Mayama, Mikao; Matsuura, Shinzo; Matsumoto, Kouichi; and Wakisaka, Yoshiharu, 3,890,436.

Matt, Ann K.: *See—*
Gagnon, Rudolph A.; and Matt, Ann K., 3,889,854.

Matthey-Doret, Pierre Andere: *See—*
Steinegger, Hans; Glauser, Walter; Rossier, Jean-Pierre; Crausaz, Rene; and Matthey-Doret, Pierre Andere, 3,889,428.

Max Kabushiki Kaisha: *See—*
Hosaka, Hideo, 3,889,338.

Maxey, Carl W., to Black Clawson Company, The. Automatic edger set works method and apparatus. 3,890,509, Cl. 250-561.000.

May & Baker Limited: *See—*
Buttimore, David, 3,890,131.

Mayama, Mikao: *See—*
Shoji, Jun'Ichi; Mayama, Mikao; Matsuura, Shinzo; Matsumoto, Kouichi; and Wakisaka, Yoshiharu, 3,890,436.

Mayer, Hans; and Schroeder, Heinz-Jurgen, to Siemens Aktiengesellschaft. Steam generator feed-water preheater improvement. 3,889,641, Cl. 122-32.000.

Mayer, Helmut, to Gerbrueder Mayer. Apparatus for detaching platelets which are adhering to a strip. 3,890,191, Cl. 156-541.000.

Mayerhoefer, Horst; Mueller, Wolfgang; Soliberger, Urs; and Wolf, Rainer, to Sandoz Ltd. Dicyclic diphosphates and diphosphites. 3,890,409, Cl. 260-927.00R.

Mayfran Incorporated: *See—*
Ross, Thomas A., 3,889,822.

Mayland, Walter: *See—*
Gathmann, Dietrich; and Mayland, Walter, 3,890,102.

Mayo, Kenneth E., to Sanders Associates, Inc. Pipeline condition analyzer. 3,889,522, Cl. 73-40.50R.

Maytag Company, The: *See—*
Saunders, James F., 3,890,477.

Mazur, Sylvester S.: *See—*
Herbenar, Edward J.; and Mazur, Sylvester S., 3,890,052.

MB Associates: *See—*
Curtis, Herbert E., 3,889,652.

McCabe, Francis J. Heat actuated link. 3,889,314, Cl. 16-48.500.

McCabe, Robert V., to ESM, Inc. Apparatus for filtering particulate matter from a fluid stream. 3,890,290, Cl. 210-136.000.

McCarthy, Brian Dennis; and Krause, Anthony Victor, to Sanders Associates, Inc. Cathode ray tube apparatus. 3,890,541, Cl. 315-366.000.

McChesney, James D.: *See—*
Fox, Eugene J.; and McChesney, James D., 3,890,299.

McCollum, Anthony W., to Eastman Kodak Company. Novel acetals and methods for their preparation. 3,890,306, Cl. 260-240.00E.

McCoy, Frederic C.; and Schlicht, Raymond C., to Texaco Inc. Selective adsorption of high viscosity, low viscosity index components from hydrocarbon mixtures. 3,890,219, Cl. 208-310.000.

McCoy, Thomas A., to Carando Machine Works. Metal cup abrading machine. 3,889,427, Cl. 51-80.00A.

McDaniel, Johnny B. Lock of ground indicator. 3,890,030, Cl. 339-113.00L.

McDonald, William F.: *See—*
Wharton, Franklin Eugene, 3,889,587.

McDonnell Douglas Corporation: *See—*
Boehringer, Wilfred E., 3,889,789.
Boehringer, Wilfred E.; Little, Jane; Rothi, Robert D.; and Westlund, Charles G., 3,890,064.

McDonnold, Dion C. Anti-slip shoe attachment. 3,889,401, Cl. 36-7.600.

McFadden, Daniel G.; and Levine, Richard C., to DieComp, Inc. Apparatus and method for automatic splitting of die cavities. 3,889,876, Cl. 235-151.100.

McFarlane, Finley E.; and Davis, Thomas G., to Eastman Kodak Company. Copolyester prepared by contacting acyloxy benzoic acid with a polyester of ethylene glycol and dicarboxylic acid. 3,890,256, Cl. 260-47.00C.

McGee, Kevin, to Sir Howard Grubb Parsons & Co., Limited. Adjustable-spring attenuator for radiated beams. 3,890,033, Cl. 350-266.000.

McGough, Thomas Clifton, Jr., to Combustion Engineering, Inc. Actuating device for multiple dampers. 3,889,552, Cl. 74-519.000.

McKee, Lewis W.; Donner, William E.; Oliva, Victor B.; Berglund, Harold R.; and Morrison, John C., to Barden Corporation, The. Yarn covering spindle. 3,889,456, Cl. 57-18.000.

McKenney, John D.: *See—*
Miller, Leslie R.; and McKenney, John D., 3,889,343.

McLellan, Peter George: *See—*
Melling, William Gordon; Stevens, John; McLellan, Peter George; Smith, Brian Turton; Massey, Richard Gascoine; Knight, John Barrington; and Lang, Robert Nigel, 3,890,556.

McNair, Samuel L., to Dazey Products Co. Combined storage holder and sharpener for knives. 3,889,809, Cl. 206-372.000.

McNally Pittsburg Manufacturing Corporation, The: *See—*
Pate, Robert Lee, 3,889,826.

McNeil Corporation: *See—*
Getz, Gary R., 3,890,073.
Pamer, Karl A., 3,889,929.

McPherson, Gregg K.: *See*—
Marsh, Jeffrey D.; and McPherson, Gregg K., 3,890,517.
McVey, Charles W., to Addressograph-Multigraph Corporation. Electric-set numbering wheel. 3,889,593, Cl. 101-110.000.
McWhirter, John Ruben: *See*—
LaClair, Louis Maynard; McWhirter, John Ruben; and Ross, William Lawrence, 3,890,231.
Medical Development Corporation: *See*—
Holbrook, Legrand K., 3,889,920.
Mehl, Jack Judson, to Becton, Dickinson and Company. Method and apparatus for the collection, cultivation and identification of microorganisms from body fluid. 3,890,203, Cl. 195-139.000.
Meidensha Electric Mfg. Co., Ltd.: *See*—
Hirao, Toshiro, 3,889,711.
Meili, Ernst, to F. Knobel Elektro-Apparatebau AG. Method for fabricating a choke with adjustable air gap and choke produced thereby. 3,889,360, Cl. 29-593.000.
Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, to Bayer Aktiengesellschaft. 1,2,4-Triazole antimycotic compositions and use thereof. 3,890,442, Cl. 424-269.000.
Melead, James J., to Beloit Corporation. Center start surface wind reel with automatic cut-off and transfer. 3,889,892, Cl. 242-56.00R.
Melling, Richard; Wright, Donald Curtis; and Pickup, John, to Pilkington Brothers Limited. Method of toughening glass. 3,890,128, Cl. 65-116.000.
Melling, William Gordon; Stevens, John; McLellan, Peter George; Smith, Brian Turton; Massey, Richard Gascoine; Knight, John Barrington; and Lang, Robert Nigel, to Westinghouse Brake & Signal Co. Ltd. Battery chargers. 3,890,556, Cl. 320-21.000.
Membrino, Hercules. Opening, filling and sealing device for thermoplastic bags. 3,889,449, Cl. 53-189.000.
Menet, Albert: *See*—
Chabardes, Pierre; Julia, Marc; and Menet, Albert, 3,890,393.
Merchant, Philip, Jr., to Petro-Tex Chemical Corporation. Treatment of process water. 3,890,227, Cl. 210-51.000.
Merck & Co., Inc.: *See*—
Novello, Frederick C., 3,890,313.
Taub, David, 3,890,351.
Merkenich, Karl: *See*—
Vogt, Wilhelm; Auer, Eberhard; Lenz, Gunter; Merkenich, Karl; and Henning, Klaus, 3,890,291.
Merle, Joseph. Lens tray. 3,889,815, Cl. 211-41.000.
Merlin Gerin: *See*—
Pelenc, Yves; Ambier, Jean; and Lavergne, Roger, 3,890,607.
Meshek, Harry M.; and Street, Vern A., to Phillips Petroleum Company. Apparatus and method for altering process control in response to a power interruption. 3,890,494, Cl. 235-153.00R.
Messa, Pietro. Rotary hook for thread-knotting machines. 3,889,990, Cl. 289-5.000.
Messrs. Lakufol Kunstsloffe GmbH & Co.: *See*—
Oggesen, Heinrich, 3,889,869.
Metz, Fred L.; and Scozzie, James A., to Diamond Shamrock Corporation. Preparation of pyrrolines by the amination of ketones. 3,890,345, Cl. 260-313.100.
Meynard, Jean-Yves, to Societe Nouvelle Siplast. Method of producing a thermoplastic composition comprising essentially bitumen and an elastomer, and product thus obtained. 3,890,263, Cl. 260-28.5AS.
Mezquita, Mario Suso. Artificially aged beverage bottle and method for producing the same. 3,890,449, Cl. 426-127.000.
Microwave and Electronic Systems Ltd.: *See*—
Moran, Michael James, 3,890,615.
Middlemiss, David, to Allen and Hanburys Limited. Isoindoline derivatives. 3,890,347, Cl. 260-326.100.
Middleton, William Joseph, to du Pont de Nemours, E. I., and Company. Trifluoromethylbenzophenone O-acyloximes and their use as crop yield increasers for plants. 3,890,135, Cl. 71-121.000.
Midland-Ross Corporation: *See*—
Huffman, Herman M.; Swanson, Kenneth B.; and Jensen, Kenneth D., 3,889,467.
Palm, Walter C.; and Lyon, James E., 3,889,935.
Miesel, John L., to Eli Lilly and Company. 6-Nitro-2-polyhaloalkylbenzimidazoles. 3,890,343, Cl. 260-309.200.
Mifune, Hideo: *See*—
Kanaya, Iwao; Ishikawa, Kazuo; and Mifune, Hideo, 3,890,588.
Mihic, Wlajko. Device for attaching an insert to a toolholder. 3,889,332, Cl. 29-96.000.
Mikkelsen, Stig Glerup: *See*—
Kristensen, Erik Edeling; and Mikkelsen, Stig Glerup, 3,890,570.
Millard, Richard J.; and Poat, David R., to Sprague Electric Company. Screen printed solid electrolytic capacitor. 3,889,357, Cl. 29-570.000.
Miller, Allan W.: *See*—
Zehring, Robert B.; Kinninger, Richard W.; and Miller, Allan W., 3,889,787.
Miller, Delmar S.: *See*—
Wiechowski, Joseph W.; Miller, Delmar S.; and Kostner, Richard C., 3,889,579.
Miller, George E., Jr.; Kahn, Paul; and Dabney, William C., to Cutter Laboratories, Inc. Tubular unit with vessel engaging cuff structure. 3,889,685, Cl. 128-348.000.
Miller, Gerald K.: *See*—
Bull, David W.; and Miller, Gerald K., 3,889,535.
Miller, Leslie R.; and McKenney, John D., to Royal Industries, Inc. Automatic collet hinge/screw placement machine. 3,889,343, Cl. 29-211.00D.
Miller, Matthew N., to Fairchild Industries, Inc. Multi-position door and hinge. 3,889,843, Cl. 220-332.000.
Miller, Owen A. Dip type measuring dispenser. 3,889,539, Cl. 73-425.40R.
Miller, Paul J., to Weatherhead Company, The. Selective cold work hardening of metallic extrusions. 3,890,106, Cl. 29-183.000.
Miller, Richard H., to General Electric Company. Electric circuit breaker with series connected interrupting and isolating breaks. 3,890,258, Cl. 200-150.00R.
Miller, Stanley J.; and Hook, Bernard, to Gulf & Western Manufacturing Company. Horizontal can ironing press. 3,889,509, Cl. 72-349.000.
Milonov, Oleg Borisovich: *See*—
Kapitanov, Nikolai Nikolaevich; Petrova, Natalya Petrovna; Milonov, Oleg Borisovich; and Dyachikhin, Anatoly Alexandrovich, 3,889,683.
Minami, Toshihiro: *See*—
Yamakoshi, Noboru; Minami, Toshihiro; and Somekawa, Sinitiro, 3,889,510.
Minieri, Pasquale P., to Tenneco Chemicals, Inc. Polyvinyl halide resin compositions. 3,890,270, Cl. 260-45.80N.
Minnesota Mining and Manufacturing Company: *See*—
Schmid, Ronald F., 3,890,623.
Viker, Harris W.; and Kropp, William E., 3,889,844.
Minolta Camera Kabushiki Kaisha: *See*—
Yoshio, Kuramoto; and Toshio, Kobori, 3,890,625.
Minor, John T., to Agrico Chemical Company. Method of purifying wet process phosphoric acid. 3,890,097, Cl. 23-300.000.
Miska, Stefania. Hair band protector. 3,889,298, Cl. 2-174.000.
Mito, Yotaka: *See*—
Oishi, Ryota; Mito, Yotaka; Yamauchi, Kenji; Takahashi, Katsuyuki; and Hirata, Kazushi, 3,890,433.
Mitsubishi Denki Kabushiki Kaisha: *See*—
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Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
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Kojima, Takeshima; Iizuka, Masabumi; Kabayama, Kenta; and Izawa, Shizuhiro, 3,890,616.
Mitsubishi Kizoku Kabushiki Kaisha: *See*—
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Kanetaka, Junichi; Mori, Shoichiro; and Kobayashi, Itaru, 3,890,361.
Mitsui, Kazuhiko, to Olympus Optical Co., Ltd. Endoscope. 3,889,662, Cl. 128-6.000.
Mitsui Shipbuilding & Engineering Co. Ltd.: *See*—
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Mitsui Toatsu Chemicals Incorporated: *See*—
Kiyoura, Tadamitsu; Takahashi, Toru; and Kogure, Yasuo, 3,890,381.
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Sasame, Takao; Takahashi, Kentaro; Nakamura, Yoshikatsu; and Miura, Kazumasa, 3,890,070.
Miyahara, Kingo, to Dowa Co., Ltd. Liquid fuel burner for burning liquid fuel in gasified form. 3,890,086, Cl. 431-168.000.
Miyamoto, Akio: *See*—
Matsukawa, Hiroharu; Miyamoto, Akio; and Watanabe, Akio, 3,890,156.
Miyamoto, Naomichi. Microtome knife sharpening machine. 3,889,425, Cl. 51-56.000.
Miyamura, Sadao; Ogasawara, Nagahiro; and Otsuka, Hitoshi, to Japan Antibiotics Research Association. Process for the production of bicyclomycin. 3,890,199, Cl. 195-80.00R.
Miyauchi, Yoshio; and Okuno, Tetsuji, to Dainippon Screen Seizo Kabushiki-Kaisha. Mechanism for mounting contact screen in photoengraving camera. 3,890,042, Cl. 355-53.000.
Mizuno, Nobuhiko; and Wakai, Hideo, to Cashew Company, Ltd. Cashew unshelling apparatus. 3,889,583, Cl. 99-576.000.
Mo, Frank S. C.; and Natwick, Vernon R., to International Video Corporation. Helical scan magnetic tape transport system including vacuum column tension control and helical scanner air bearing. 3,890,641, Cl. 360-71.000.
Mobelec International Limited: *See*—
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Mobil Oil Corporation: *See*—
Cushman, Donald R.; Oberright, Edward A.; Edwards, Roy T., deceased; and Edwards, Katherine, legal representative, 3,890,158.
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Mocarski, Stanislaw, to Ford Motor Company. Method of producing a forged article from prealloyed water-atomized ferrous alloy powder. 3,889,350, Cl. 29-420.500.
Mog, Walter F.: *See*—
Brunnett, Carl J.; Gibson, Jeremy H.; Mog, Walter F.; and Smith, Richard S., 3,890,355.
Mohr, Robert G.; Hodges, Ronald R.; Hockenberry, Jack; Scheerhorn, Douglas; and Wilcox, Gale F., to Steelcase Inc. End panel support system. 3,890,023, Cl. 312-198.000.
Moinard, Jean Robert: *See*—
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Mommer, Richard Paul, to Balcom Chemicals, Inc. Dispensing and metering package. 3,889,855, Cl. 222-355.000.

Monahan, Alan R., to Xerox Corporation. Light activating imaging process. 3,890,147, Cl. 96-27.00R.

Monsanto Company: *See—*
Iobal, Abul Fateh Mohammed, 3,890,346.
Kerst, Al F., 3,890,378.
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Monsanto Research Corporation: *See—*
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Montesissa, Giorgio; and Del Signore, Giancarlo, to Duco S.p.A. Acidic oleo-acrylic resins and processes for preparing same. 3,890,259, Cl. 260-23.00H.

Moon, Howard R. Corner fitting. 3,890,022, Cl. 312-140.000.

Mooney, Thomas, to I-T-E Imperial Corporation. Tubular coupling with insulative throat liner. 3,890,458, Cl. 174-83.000.

Moore, Trevor J., to Perkins Engines Limited. Engine cooling system. 3,889,644, Cl. 123-41.770.

Moore, William R.; and Vaughn, Walter L., to Dow Chemical Company, The. Polysulfone copolymers. 3,890,287, Cl. 260-79.30A.

Moran, Michael James, to Microwave and Electronic Systems Ltd. Target detection system. 3,890,615, Cl. 343-5.0PD.

Moran, William Joseph: *See—*
Bann, Robert Francis; Moran, William Joseph; and Roth, Philip B., 3,890,095.

Morane, Bruno, to Societe Anonyne dite: L'Oreal. Dispensing cap for valved, pressurized container. 3,889,856, Cl. 222-402.130.

Moreiras, Luis: *See—*
Wellman, Ellis M.; and Moreiras, Luis, 3,889,879.

Moreno, Enrique. Machine for the determination of protrombin time and p.t.t. 3,890,098, Cl. 23-230.00B.

Mores, Lee R.: *See—*
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Morgan, Walter A., to Exxon Research and Engineering Company. Method of making extruded rib battery separators. 3,890,184, Cl. 156-244.000.

Mori, Masatoshi: *See—*
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Mori, Shoichiro: *See—*
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Morozowich, Walter, to Upjohn Company, The. Amino substituted phenyl and naphthyl esters of PGF_2 - type compounds. 3,890,372, Cl. 260-468.00D.

Morrison, John C.: *See—*
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Morrison, Roger A., to Mobil Oil Corporation. Upgrading aliphatic naphthas to higher octane gasoline. 3,890,218, Cl. 208-135.000.

Morrow, A. Elmo, to Mac-Fab Manufacturing, Inc. Load-bundling and strapping apparatus. 3,889,585, Cl. 100-26.000.

Morse, George W. Hay product and method for forming. 3,889,884, Cl. 241-24.000.

Mosely, Donald E., to Bitco, Inc. Layer separating apparatus for lumber stacking machines. 3,889,825, Cl. 214-6.00M.

Moser, Joseph M.: *See—*
Binks, Chester J.; and Moser, Joseph M., 3,889,582.

Moser, Willard W. Tie down brackets for securing bights of flexible members. 3,889,321, Cl. 24-146.000.

Motohashi, Fujio: *See—*
Suzuki, Fumio; Hayashi, Mamoru; Kawakami, Ikuo; Motohashi, Fujio; and Iwabuchi, Yoshiki, 3,890,336.

Motoren-Werke Mannheim AG: *See—*
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Motorola, Inc.: *See—*
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Kuhn, Harry A., Jr.; and Schendel, Donald D., Jr., 3,890,580.
Russ, Malcolm J., 3,890,170.

Moulton, James A., to Rockwell International Corporation. Logarithmic monopulse receiver. 3,890,617, Cl. 343-7.00A.

Mounce, George R. Omega navigation receiver apparatus. 3,890,619, Cl. 343-105.00R.

Mount Sinai School of Medicine of the City University of New York: *See—*
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MPL, Inc.: *See—*
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MSI Data Corporation: *See—*
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Muehlethaler, Urs, to Sortex Company of North America, Inc. Translucency/opaque sorting. 3,890,221, Cl. 209-111.700.

Mueller, Noel J. Highway tanker wagon and method of making and delivering liquid products. 3,889,701, Cl. 137-1.000.

Mueller, Wolfgang: *See—*
Mayerhoefer, Horst; Mueller, Wolfgang; Soliberger, Urs; and Wolf, Rainer, 3,890,409.

Mulligan, Jack E., to Ramsey Corporation. Apparatus for assembling piston ring end guides. 3,889,342, Cl. 29-211.00D.

Mullins, Albert A., to Schlumberger Technology Corporation. Setting and releasing apparatus for sidewall anchor. 3,889,750, Cl. 166-217.000.

Murphy Chemical Ltd.: *See—*
Brown, John Graham; and Payne, Henry Arthur Sheldon, 3,890,446.

Murphy, John Arthur: *See—*
Limb, John Ormond; and Murphy, John Arthur, 3,890,462.

Murphy, John R. Fireplace extinguisher. 3,889,738, Cl. 169-49.000.

Murphy, Thomas L.: *See—*
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Muschiatti, Lawrence Carl: *See—*
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Mutz, Gerhard; and Bausch, Edmund, to Binder Magnete GmbH. Step motor with oscillation damping. 3,890,514, Cl. 310-49.000.

Nadolny, Felix J. Torque control adaptor for ratchet wrench. 3,889,490, Cl. 64-29.000.

Nagahama, Shizuo: *See—*
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Nagashima, Shinichiro; and Tsuchiya, Kaichi, to Canon Inc. Organic photoconductive materials derived from reacting a photoconductive compound with a color compound. 3,890,146, Cl. 96-1.500.

Naigai Industries, Inc.: *See—*
Kumakawa, Yosihiko; and Ikai, Kunio, 3,890,512.

Naito, Kazuo; Kondo, Terumitsu; and Nakajima, Kansuke. Automatic transport system. 3,889,797, Cl. 198-35.000.

Naito, Okito: *See—*
Yasukawa, Hideaki; and Naito, Okito, 3,889,460.

Nakajima All Kabushiki Kaisha: *See—*
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Nakajima, Kansuke: *See—*
Naito, Kazuo; Kondo, Terumitsu; and Nakajima, Kansuke, 3,889,797.

Nakamichi Research Inc.: *See—*
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Nakamura, Tetsuya; and Kijima, Shizumasa, to Eisai Company, Ltd. Chromanol nicotinate derivatives. 3,890,333, Cl. 260-295.50B.

Nakamura, Yasuharu; Nakazawa, Yoshiyuki; Sueyoshi, Tohru; and Sato, Akira, to Fuji Photo Film Co., Ltd. Radiation-sensitized fine-grained silver halide photographic sensitive material. 3,890,155, Cl. 96-137.000.

Nakamura, Yoshikatsu: *See—*
Sasame, Takao; Takahashi, Kentaro; Nakamura, Yoshikatsu; and Miura, Kazumasa, 3,890,070.

Nakane, Hisashi: *See—*
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Nakanishi, Fusae: *See—*
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Nakanishi, Hachiro: *See—*
Hasegawa, Masaki; Nakanishi, Fusae; Nakanishi, Hachiro; Watanabe, Shoji; Suzuki, Yasuzo; Nakane, Hisashi; Aoyama, Toshimi; Komatsubara, Yukio; Nojima, Setsuo; and Tagami, Hiroshi, 3,890,150.

Nakano, Masao; and Imazeki, Kazuyoshi, to General Research of Electronics, Inc. Time-sharing scanning receiver. 3,890,574, Cl. 325-470.000.

Nakao, Masaru: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Sasajima, Kikuo; Nakao, Masaru; Maruyama, Isamu; Ono, Keiichi; and Katayama, Shigenari, 3,890,323.

Nakawaki, Yoshiharu, to Kabushiki Kaisha Suehiro Sharyo Seisakusho. Trailers. 3,889,977, Cl. 280-408.000.

Nakazawa, Yoshiyuki: *See—*
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National Machinery Company, The: *See—*
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National Research Development Corporation: *See—*
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Nechay, Jacek A., to Torin Corporation. Resilient hub assembly. 3,890,061, Cl. 416-134.000.

Nederlandse Organisatie Voor Toegepast-Natuurweten-Schappelijk Onderzoek Ten Behoeve Van Nijverheid, Handel En Verkeer: *See—*
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Nehring, John R., to International Paper Company. Self-contained fluid evacuator. 3,889,677, Cl. 128-278.000.

Nelson, Norman C.; and Harley, Daniel C., to Kel-Lite Industries, Inc. Battery recharging circuit with indicator lights. 3,890,555, Cl. 320-2.000.

Nelson, Norman E., to Alexander, Sell, Steldt & DeLaHunt. Cartridge tape guide. 3,889,900, Cl. 242-199.000.

Nelson, Perry L.: *See—*
Porter, Kenneth E.; and Nelson, Perry L., 3,889,418.

Nemec, Josef, to Ceske vysoke uceni technicke. Method and apparatus for testing the fusion weldability of metallic materials. 3,889,519, Cl. 73-15.00R.

Neomat AG: *See—*
Kaspar, Hans, 3,889,439.

New Zealand Dairy Board: *See—*
Russell, Ronald William, 3,889,448.

New Zealand Dairy Research Institute: *See—*
Russell, Ronald William, 3,889,448.

Neward, Theodore C. Method of making a bipolar electrode structure. 3,890,420, Cl. 264-261.000.

Newhall, Jay H. Vivo temperature sensing method and apparatus. 3,889,658, Cl. 128-2.00H.

Nichol, George D.; and Schmidt, John C. Tray for sterilizing dental instruments. 3,890,096, Cl. 21-105.000.

Nicholson, Brian, to Norprint Limited. Hand-held self-adhesive-label applicators. 3,889,594, Cl. 101-111.000.

Nicolay, Karl; Buschmann, Karl; and Madueno, Jesus Perez, to Durkoppwerke GmbH. Feed for sewing machine. 3,889,614, Cl. 112-153.000.

Niehaus, William Charles: *See—*
DiLorenzo, James Vincent; Niehaus, William Charles; Rode, Daniel Leon; and Schwartz, Bertram, 3,890,215.

Nielsen, Jorgen Carsten. Wooden door blades. 3,889,422, Cl. 49-501.000.

Nihon Denshi Kabushiki Kaisha: *See—*
Tanaka, Akira, 3,890,533.

Nijweide, Robert Jan, to Verenigde Mengvoederfabrieken. Method of conditioning meal. 3,890,454, Cl. 426-508.000.

Nikitinsky, Mikhail Pavlovich: *See—*
Glushko, Mikhail Fedorovich; Nikitinsky, Mikhail Pavlovich; Pakhomov, Ilya Fedorovich; and Kurgansky, Oleg Fedorovich, 3,889,524.

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Nippon Electric Company, Limited: *See—*
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Yoshimura, Syoichiro, 3,889,811.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
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Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See—*
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Nippon Hoso Kyokai: *See—*
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Nippon Oil Co., Ltd.: *See—*
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Nippon Piston Ring Co., Ltd.: *See—*
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Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See—*
Ohara, Takashi; Ninomiya, Michikazu; Yanagisawa, Isao; Ueshima, Michio; and Takata, Masahiro, 3,890,248.

Nishi, Sunao; Ikeda, Shojiro; and Kawazoe, Asao, to Shinto Kogyo Kabushiki Kaisha. Method of forming a crimped tube joint. 3,889,354, Cl. 29-516.000.

Nishida, Masamitsu; and Ouchi, Hiromu, to Matsushita Electric Industrial Co., Ltd. Piezoelectric ceramic compositions. 3,890,241, Cl. 252-62.900.

Nishikawa, Takeo: *See—*
Shimada, Keizo; Nishikawa, Takeo; Harada, Toshiaki; and Nagahama, Shizuo, 3,890,403.

Nissan Chemical Industries, Ltd.: *See—*
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Nissan Motor Company Limited: *See—*
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Hosaka, Akio; Baba, Kosaku; and Wazawa, Kiyoshi, 3,890,594.
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Noguchi, Junpei: *See—*
Ohkubo, Kinji; Noguchi, Junpei; Ohmura, Kunioki; and Hinata, Masanao, 3,890,154.

Noguchi, Yukihide, to Takeda Chemical Industries, Ltd. Method and apparatus for printing indicia on products. 3,889,591, Cl. 101-37.000.

Nojima, Setsuo: *See—*
Hasegawa, Masaki; Nakanishi, Fusae; Nakanishi, Hachiro; Watanabe, Shoji; Suzuki, Yasuzo; Nakane, Hisashi; Aoyama, Toshimi; Komatsubara, Yukio; Nojima, Setsuo; and Tagami, Hiroshi, 3,890,150.

Nolte, David G., to Texaco Inc. Leak-detection apparatus and liquid level variations detector. 3,889,523, Cl. 73-49.200.

Nomura, Junji: *See—*
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Noneman, Thomas S.; Smith, Thomas R.; and Stokes, John B., to Tomco Plastic Inc. Molded plastic drawer. 3,890,024, Cl. 312-330.000.

Nordblad, Sven Sigurd; and Svensson, Karl-Erik, to Telefonaktiebolaget L M Ericsson. Method and an arrangement for voltage testing and drying of electrically insulated conductors. 3,890,566, Cl. 324-54.000.

Norprint Limited: *See—*
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Nicholson, Brian, 3,889,594.

Norsk Hydro A.S.: *See—*
Kleveland, Sigbjorn, 3,890,214.

North, Arthur J.; and Stover, Raymond W., to Xerox Corporation. Self-biased development electrode and reproducing machine employing same. 3,889,637, Cl. 118-637.000.

Northrop Corporation: *See—*
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Norton Company: *See—*
Barks, Ronald E., 3,890,072.
Richerson, David W., 3,890,250.
Villani, Gerard J.; and Fedora, Ronald P., 3,889,347.

Nosco Plastics, Inc.: *See—*
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Novak, Warren D. Slide compass. 3,889,377, Cl. 33-27.00C.

Novello, Frederick C., to Merck & Co., Inc. 3-Diazine substituted benzothiadiazines. 3,890,313, Cl. 260-243.00D.

Nozaki, Teruhiko, to Kobe Steel, Inc. Method and apparatus for producing a casting having a satisfactory surface with a continuous casting operation. 3,890,167, Cl. 148-9.500.

Nusonics, Inc.: *See—*
Zacharias, Ellis M., Jr., 3,890,423.

Nyby Bruk AB: *See—*
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Nye, James Leroy: *See—*
Hull, Thomas Neil, Jr.; Nye, James Leroy; and Steyer, William, 3,889,882.

Obadal, Richard Dick; and Loynachan, William David, to Deere & Company. Reinforced flexible tube. 3,889,717, Cl. 138-131.000.

Obendorf, Werner; Lindner, Irmgard; Schwarzinger, Ernst; and Krieger, Josef, to Chemie Linz Aktiengesellschaft. Derivatives of triiodo aminobenzenecarboxylic acids and the preparation thereof. 3,890,318, Cl. 260-247.20A.

Obenschain, Arthur W., to United States of America, Navy. Measuring core reductance. 3,890,565, Cl. 324-43.00R.

Oberg Manufacturing Co., Inc.: *See—*
Vecchi, John C., 3,889,565.

Oberright, Edward A.: *See—*
Cushman, Donald R.; Oberright, Edward A.; Edwards, Roy T., deceased; and Edwards, Katherine, legal representative, 3,890,158.

O'Brien, Charles J.: *See—*
Beichel, Rudi; and O'Brien, Charles J., 3,889,462.

O'Brien, William J. Rotary steam engine. 3,890,071, Cl. 418-260.000.

Occanneechi Orchards, Inc.: *See—*
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Ocean Protein Corporation: *See—*
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Ochiai, Michihiko; Aki, Osami; Morimoto, Akira; Okada, Taiiti; and Masuda, Katsutada, to Takeda Chemical Industries, Ltd. Cephalosporin derivatives. 3,890,309, Cl. 260-243.00C.

Ochs, David J.; and Behrens, James D. Emergency medical harness. 3,889,668, Cl. 128-134.000.

O'Connor, Sean E. Flexible highway marker. 3,890,054, Cl. 404-10.000.

O'Connor, Thomas F.: *See—*
Jackson, Ira J.; O'Connor, Thomas F.; and Buckley, James H., 3,889,589.

O'Donnell, Leopold Henry; Forget, Robert; and Hasrouni, Youssef, to Canada, Her Majesty the Queen in right of, as represented by the Secretary of State. Video tape recording animation system. 3,890,639, Cl. 360-14.000.

Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.): *See—*
Hivert, Andre R.; and Galmiche, Philippe M., 3,890,145.

Offner, Burton E. Stock shelf layout indicators. 3,889,408, Cl. 40-10.00R.

Offshore Company, The: *See—*
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Ogasawara, Nagahiro: *See*—
Miyamura, Sadao; Ogasawara, Nagahiro; and Otsuka, Hitoshi, 3,890,199.

Ogasawara, Tatsuo: *See*—
Sasaki, Rentaro; Watanabe, Akinori; Ogasawara, Tatsuo; and Sogabe, Hidetoshi, 3,890,609.

Ogawa, Hiroshi: *See*—
Oguri, Eizo; Ogawa, Hiroshi; Date, Koki; and Takeba, Kanji, 3,889,388.

Ogawa, Yasuhiro; and Awata, Norio, to Kanegafuchi Boseki Kabushiki Kaisha. Stabilization and purification of β-lactones. 3,890,312, Cl. 260-343.900.

Oggesen, Heinrich, to Messrs. Lakufol Kunstsloffe GmbH & Co. Carrier-bag. 3,889,869, Cl. 229-54.00R.

Oguri, Eizo; Ogawa, Hiroshi; Date, Koki; and Takeba, Kanji, to Takeda Chemical Industries, Ltd. Method of and device for drying small solids. 3,889,388, Cl. 34-10.000.

Oguri, Yoshiko: *See*—
Yukuta, Toshio; Ohashi, Takashi; and Oguri, Yoshiko, 3,890,293.

O'Hara, Arthur C. Hose coiling apparatus. 3,889,896, Cl. 242-86.000.

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Yukuta, Toshio; Ohashi, Takashi; and Oguri, Yoshiko, 3,890,293.

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Watanabe, Takashi; Watamura, Koichi; Kawatani, Kazuya; and Aoki, Hideo, 3,890,564.

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Ohnishi, Kenji: *See*—
Sato, Masao; Aizawa, Tsuneo; Ohnishi, Kenji; Koizumi, Shigeo; Fukuda, Akio; Kikuchi, Shinki; and Kusanagi, Shichiro, 3,889,561.
Sato, Masso; Aizawa, Tsuneo; Ohnishi, Kenji; Koizumi, Shigeo; Fukuda, Akio; Kikuchi, Shinki; and Kusanagi, Shichiro, 3,889,567.

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Ochiai, Michihiko; Aki, Osami; Morimoto, Akira; Okada, Taiiti; and Masuda, Katsutada, 3,890,309.

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Okaya Electric Industry Co., Ltd.: *See*—
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Sasaki, Rentaro; Watanabe, Akinori; Ogasawara, Tatsuo; and Sogabe, Hidetoshi, 3,890,609.

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Oliver, Alton D.: *See*—
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Mitsui, Kazuhiko, 3,889,662.

O'Melia, Frances C., to Dow Chemical Company, The. Nematicidal compositions comprising 2-chloro-6-methoxy-4-(trichloromethyl)-pyridine and S-methyl N-[(methyl carbamoyl)oxy]thioacetimidate. 3,890,440, Cl. 424-263.000.

Ono, Keiichi: *See*—
Yamamoto, Hisao; Inaba, Shigeho; Sasajima, Kikuo; Nakao, Masaru; Maruyama, Isamu; Ono, Keiichi; and Katayama, Shigenari, 3,890,323.

Orenstein, Jack. Anti-splatter device. 3,890,450, Cl. 426-132.000.

Original Hanau Quarzlampen GmbH: *See*—
Sturm, Walter H., 3,890,510.

Orr, Wallace H.; and Grindle, James L., to General Electric Company. Electrical socket. 3,890,027, Cl. 339-64.00R.

Orzel, Stanley P. Color coded wood carving stock and method. 3,889,398, Cl. 35-26.000.

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Osborne, Geoffrey Vaughan; and Rowland, Roger Gilbert, to National Research Development Corporation. Prosthetic hip joint devices. 3,889,299, Cl. 3-1.000.

Ostendorf, Heinrich: *See*—
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Otani, Syuichi, to Nissan Motor Company Limited. Linear tension damping device. 3,889,969, Cl. 280-150.0SB.

O'Toole, Peter J., to International Harvester Company. Hydraulic brakes system for mobile vehicles. 3,890,012, Cl. 303-6.00R.

Otsuka, Hitoshi: *See*—
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Ott, Henry Whitfield, to John Ott Laboratories, Inc. Apparatus for operating gaseous discharge lamps on direct current from a source of alternating current. 3,890,540, Cl. 315-335.000.

Ottoson, Charles Folke Sigvard: *See*—
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Ouchi, Hiromu: *See*—
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Ousterling, David L.; and Jones, Harold F., to Allied Chemical Corporation. Etching machine. 3,889,696, Cl. 134-57.00R.

Overmyer Mould Company of Pennsylvania: *See*—
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Owens-Corning Fiberglas Corporation: *See*—
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Owens, Frederick J.; Bishop, Jerry B.; and Fidelman, David, to Aerosonic Corporation. Directional gyroscope. 3,889,387, Cl. 33-318.000.

Owens-Illinois, Inc.: *See*—
Hill, James A.; and Keefer, George E., 3,889,744.

Owings, Joe T.; and Martin, Sarden B., to Deering Milliken Research Corporation. Loom crankshaft support. 3,889,718, Cl. 139-1.00R.

Owsen, Peter, to Ridonia Wheel, Inc. Safety wheel. 3,889,734, Cl. 152-158.000.

Oxy Metal Industries Corporation: *See*—
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P. R. Mallory & Co., Inc.: *See*—
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Glushko, Mikhail Fedorovich; Nikitinsky, Mikhail Pavlovich; Pakhomov, Ilya Fedorovich; and Kurgansky, Oleg Fedorovich, 3,889,524.

Palac, Kazimir, to Zenith Radio Corporation. Faceplate mounting structure for cathode ray tube color selection electrode. 3,890,526, Cl. 313-408.000.

Palm, Walter C.; and Lyon, James E., to Midland-Ross Corporation. Vehicle body height control valve. 3,889,935, Cl. 267-65.00D.

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Pamer, Karl A., to McNeil Corporation. Force limited power actuated device. 3,889,929, Cl. 254-173.00B.

Panduit Corporation: *See*—
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Fain, Pavel Ioelievich; Zimin, Vladimir Anatolievich; Strashun, Aron Zakharovich; Isupova, Tamara Ivanovna; Pankratov, Alexandr Ivanovich; and Romanov, Georgy Ivanovich, 3,890,457.

Panofski, Ernst; and Rasch, Erhard, to Patent-Treuhand-Gesellschaft fur Elekstriche Gluhlampen mbH. Low pressure mercury vapor discharge lamp with amalgam. 3,890,531, Cl. 313-490.000.

Paolini, John P.: *See*—
Palopoli, Frank P.; and Paolini, John P., 3,890,328.

Park, John N.; Peak, Steven C.; and Steigerwald, Robert L., to General Electric Company. Solid state chopper ballast for gaseous discharge lamps. 3,890,537, Cl. 315-208.000.

Parsons, Hubert J., to Hardinge Brothers, Inc. Seals for collets. 3,889,962, Cl. 279-46.000.

Passons, William Erby; and Card, Joseph Lewis. Tufted fringe product. 3,889,616, Cl. 112-409.000.

Pastoriza, James J., to Analog Devices, Incorporated. Constant-current digital-to-analog converter. 3,890,611, Cl. 340-347.0DA.

Pate, Robert Lee, to McNally Pittsburg Manufacturing Corporation, The. Reversible car plow feeder for stock pile recovery systems. 3,889,826, Cl. 214-17.0DA.

Patek Philippe S.A.: *See—*
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Patel, Himanshu M.; and Dimmick, George D., to Westinghouse Electric Corporation. Triad color screen having elements larger than mask apertures near screen center and smaller near periphery. 3,890,527, Cl. 313-408.000.

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Patterson, Frank Knowles, to du Pont de Nemours, E. I., and Company. Semiconductive oxides. 3,890,251, Cl. 252-519.000.

Patterson, James A. Wall formed conduit for swimming pools and method of making the same. 3,890,230, Cl. 210-169.000.

Paty, Marcel: *See—*
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Pax Systems, Inc.: *See—*
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Peak, Steven C.: *See—*
Park, John N.; Peak, Steven C.; and Steigerwald, Robert L., 3,890,537.

Pease, Floyd T., to Offshore Company, The. Anchor handling vessel. 3,889,621, Cl. 114-206.00R.

Peck & Hale, Inc.: *See—*
Strecker, William V., 3,890,053.

Peck, William S.: *See—*
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Pedersen, Poul K.: *See—*
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Pelenc, Yves; Ambier, Jean; and Lavergne, Roger, to Merlin Gerin. Electromagnetic position indicator. 3,890,607, Cl. 340-199.000.

Pendleton, Pyam; and Waldman, Myron R., to Walco Systems, Inc. Adjustable corona discharge electrode. 3,890,504, Cl. 250-325.000.

Pennell, Rolla J.: *See—*
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Perry R. Bass, Inc.: *See—*
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Personal Products Company: *See—*
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Persson, Henry, to Sibilia, Thomas W.; Cariani, Montero; and Knorr, Richard K. Floating paddle. 3,889,308, Cl. 9-307.000.

Persson, Jan Edvard, to Atlas Copco Aktiebolag. Earth drilling apparatus. 3,889,959, Cl. 277-27.000.

Pete Whitt, Inc.: *See—*
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Peter Wolters: *See—*
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Peters, Beldon A., to Exxon Production Research Company. Subsurface safety valve. 3,889,751, Cl. 166-224.00A.

Peters, Clifford M., to ACF Industries, Incorporated. Valve and actuator assembly. 3,889,922, Cl. 251-14.000.

Peters, Rex B.: *See—*
Barleen, David G.; and Peters, Rex B., 3,890,513.

Peterson, Francis C., to C. Hager & Sons Hinge Manufacturing Company. Door monitoring and controlling device for a security system. 3,890,608, Cl. 340-274.000.

Peterson, George N., to Dresser Industries, Inc. Reinforcing cup-type grinding wheels. 3,890,117, Cl. 51-209.00R.

Peterson, Henry O.: *See—*
Lee, Harold G.; and Peterson, Henry O., 3,890,488.

Peterson, William M., to Hydramet American Inc. Apparatus and method for compacting particulate materials. 3,890,413, Cl. 264-40.000.

Petranek, Milan: *See—*
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Petrovich, Vojislav. Froth flotation method for recovery of minerals by means of alkali or ammonium alkyl alkylaryl, and aryl sulfinates as froth flotation reagents. 3,890,222, Cl. 209-166.000.

Petrow, Vladimir: *See—*
Grunwell, Joyce F.; Johnston, John O.; Petrow, Vladimir; and Weintraub, Philip M., 3,890,356.

Pews, R. Garth: *See—*
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Pfahnl, Arnold; and Worobey, Walter, to Bell Telephone Laboratories, Incorporated. Technique for the fabrication of air-isolated crossovers. 3,890,177, Cl. 156-7.000.

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Phillips Petroleum Company: *See—*
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Piasek, Edmond J.; and Puskas, Imre, to Standard Oil Company. Esters of 4-(high molecular weight alkyl-substituted carbophenoxy) phthalic acid. 3,890,301, Cl. 260-234.00R.

Picker Corporation: *See—*
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Pickup, John: *See—*
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Piepers, Gijsbrecht Gerhardus; and Scholtus, Christiaan Gustaaf Adolf, to Reactor Centrum Nederland. Lattice construction. 3,889,438, Cl. 52-668.000.

Piepho, Donald A.: *See—*
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Pierret, Jean Marc: *See—*
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Pietrolewicz, John P., to Philco-Ford Corporation. Password operated system for preventing unauthorized or accidental computer memory alteration. 3,890,601, Cl. 340-172.500.

Pike, John E.; and Schneider, William P., to Upjohn Company, The. 11β-PGE$_2$-Type compounds. 3,890,371, Cl. 260-468.00D.

Pilie, Roland J.; and Mack, Eugene J., to United States of America, Navy. Fog water collector. 3,889,532, Cl. 73-170.00R.

Pilkington Brothers Limited: *See—*
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Pinomaki, Skari E. Tree harvesting machine. 3,889,729, Cl. 144-3.00D.

Pioneer Electric Corporation: *See—*
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Pirovano, Camillo. Conveying apparatus for granular materials. 3,889,799, Cl. 198-168.000.

Pirtle, James D.: *See—*
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Pitney-Bowes, Inc.: *See—*
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Pitroda, Satyan G.: *See—*
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Pitschi, Franz X.: *See—*
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Pitt, Norman, to Structural Materials. Apparatus for the preparation of siliceous ashes. 3,889,608, Cl. 110-8.00R.

Pitts, Floyd B., Jr. Brake stand for wheelchairs. 3,889,964, Cl. 280-43.240.

Platt, John D., to MSI Data Corporation. Magnetic tape transport. 3,890,642, Cl. 360-96.000.

Plempel, Manfred: *See—*
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Plock, Karl: *See—*
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Ploeckl, Johann, to Zellweger AG. Optical scanner. 3,890,034, Cl. 350-7.000.

Plunkett, Allen B., to General Electric Company. Regenerative braking circuit. 3,890,551, Cl. 318-376.000.

PneuDraulics, Inc.: *See—*
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Pneumatiques, Caoutchouc Manufacture and Plastiques Kleber-Colombes: *See—*
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Poat, David R.: *See—*
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Poclain: *See—*
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Poirier, Raymond, to Thomson-CSF. Vidicon target consisting of silicon dioxide layer on silicon. 3,890,523, Cl. 313-366.000.

Polaner, Mardy, to Barbron Corporation. Feed tube flame arrester. 3,889,649, Cl. 123-142.000.

Pollock, Johnny A.; and Spector, George. Press for home removal of piston pins. 3,889,339, Cl. 29-252.000.

Polos, Constantine D. Self-drilling anchor device. 3,889,570, Cl. 85-68.000.

Polska Akademia Nauk Instytut Maszyn Przeplywowych: *See—*
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Poly-Trusions, Inc.: *See—*
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Porta, Paolo Della; Ferrario, Bruno; Cantaluppi, Angelo; Montalenti, Paolo; and Giorgi, Fiziano A., to Saes Getters S.p.A. Catalytic cartridge. 3,890,104, Cl. 23-288.00K.

Porter, Allan William Henry, to Aktiengesellschaft Adolph Saurer. Heald machine. 3,889,720, Cl. 139-66.00R.

Porter, Allan William Henry, to Aktiengesellschaft Adolph Saurer. Braking and driving device for the shuttle of a weaving loom. 3,889,722, Cl. 139-142.000.

Porter, Kenneth E.; and Nelson, Perry L., to American Bioculture, Inc. High density treatment product. 3,889,418, Cl. 47-58.000.

Portinari, Antonio; and Alimenti, Giovanni, to Industrie Pirelli Societa per Azioni. Method and apparatus for impregnating stranded wires during stranding thereof. 3,889,455, Cl. 57-7.000.

Post Office, The: *See—*
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Postma, Peter, to Sherritt Gordon Mines Limited. Exhaust gas silencer. 3,889,776, Cl. 181-50.000.

Potter Instrument Co., Inc.: *See—*
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Pound, William C.: *See—*
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Powell, Donald G.: *See—*
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Powers, Richard T.: *See—*
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PPG Industries, Inc.: *See—*
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Prada, Luis E., to General Electric Company. Combination ice cube and crushed ice dispenser. 3,889,888, Cl. 241-101.100.

Pramstraller, Wilmuth, to Durst S.p.A. Fabbrica Macchine ed Apparecchi Fototecnici. Enlarging apparatus for use in a bright room. 3,890,043, Cl. 355-62.000.

Precision Screen Machines Inc.: *See—*
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Preco Industries, Ltd.: *See—*
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Presnick, Michael C. Inflatable insulation for packaging. 3,889,743, Cl. 165-46.000.

Pretty, Frederick A., to USM Corporation. Control for fluid pressure actuators. 3,889,586, Cl. 100-53.000.

Pretty Products, Inc.: *See—*
Wilson, Michael C., 3,889,837.

Price, Larry V., to Robertshaw Controls Company. Gage construction and spacing member therefor or the like. 3,889,840, Cl. 220-82.00A.

Priddy, Duane B., to Dow Chemical Company, The. Heterocyclic peroxides. 3,890,316, Cl. 260-247.000.

Privalov, Igor Serafimovich: *See—*
Leinek, Albert Arturovich; Khomyakov, Igor Stepanovich; Privalov, Igor Serafimovich; and Filaretova, Galina Pavlovna, 3,889,318.

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Procter & Gamble Company: *See—*
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Provi, Mike A., to Pro Products, Inc. Method of making a composite metal and plastic level. 3,889,353, Cl. 29-458.000.

Pruniaux, Bernard R.; and Assemat, Jean-Louis, to Societe Lignes Telegraphiques et Telephoniques. Ultra high frequency transistors manufacturing process. 3,890,163, Cl. 148-1.500.

Pruvot, Francois C.; Maistrelli, Roger; and Buachet, Pierre, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Engine and transmission control system. 3,890,360, Cl. 60-431.000.

Puck, Alfred: *See—*
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Puttner, Reinhold; and Arndt, Friedrich, to Schering AG. Dichlorobenzaldehyde-oxime-carbonates. 3,890,385, Cl. 260-566.0AE.

PX Petrocontrol AB: *See—*
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Pytlewski, Louis L., to Research Corporation. Inorganic stannic oxide polymers and method for the preparation thereof. 3,890,429, Cl. 423-395.000.

Quest, Karl: *See—*
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R & R Products, Inc.: *See—*
Rogers, Roy H., 3,889,761.

Rachel, Todd L., to Bendix Corporation, The. Speed governor for an engine having an electronic fuel injection system. 3,889,647, Cl. 123-102.000.

Raczek, Thaddeus A., to International Business Machines Corporation. Skinning process for expansion casting of polymeric foams. 3,890,418, Cl. 264-54.000.

Rademacher, Friedrich; Quest, Karl; Knabe, Uwe; Unger, Dieter; Jordan, Heinz; Heckmann, Werner; and Plock, Karl, to Holstein & Kappert Maschinenfabrik Phonix GmbH. Method of filling beer cans or the like. 3,889,725, Cl. 141-5.000.

Radiometer A/S: *See—*
Kristensen, Erik Edeling; and Mikkelsen, Stig Glerup, 3,890,570.

Rail, Larry E. Body support. 3,890,004, Cl. 297-423.000.

Rain Jet Corporation: *See—*
Hruby, John O., Jr., 3,889,880.

Rakestraw, Lawrence F., to Monsanto Company. Pressurized nitrogen to extrude molten steel-silicon alloy. 3,889,739, Cl. 164-82.000.

Ramsey Corporation: *See—*
Mulligan, Jack E., 3,889,342.

Rand, Myron Joel, to Bell Telephone Laboratories, Incorporated. Ohmic contacts to silicon. 3,889,359, Cl. 29-578.000.

Randour, Victor: *See—*
Blomstrom, Gary D.; Piepho, Donald A.; Randour, Victor; and York, Lyle E., 3,889,769.

Ranger, Eugene, to Combustion Engineering, Inc. Method and apparatus for suspendedly supporting a platform. 3,889,820, Cl. 214-1.0BB.

Ranieri, Louis F. Self-contained multi-blade package and assembly utilizing same. 3,889,699, Cl. 125-16.00R.

Ranini, Daniel G., to Poclain. Excavator with teeth coupled for pivotal movement in opposite senses. 3,889,405, Cl. 37-141.00R.

Rao, Vemulapalli D. N.; and Telang, Yeshwant P., to Ford Motor Company. Rubbing seal system for a rotary combustion engine. 3,890,067, Cl. 418-121.000.

Rasch, Erhard: *See—*
Panofski, Ernst; and Rasch, Erhard, 3,890,531.

Rathbone, Donald E.: *See—*
Baily, Everett M.; Rathbone, Donald E.; and Johnson, Lynn F., 3,889,796.

Ravich, Leonard E., to Gorham International, Inc. Disposable towel. 3,889,804, Cl. 206-223.000.

Ray, Robert G. Curtain rod and window shade bracket. 3,889,912, Cl. 248-255.000.

Raygo, Inc.: *See—*
Larson, Roger L., 3,889,759.

Raymond Lee Organization, Inc., The: *See—*
Bricker, Norman C., 3,889,790.
Emrich, Roy P., 3,889,399.
Joseph, Donald B., 3,890,126.

Raynal, Serge Fernand: *See—*
Lehn, Jean-Marie; Schue, Francois; Boileau, Sylvie; Kaempf, Bernd; Cau, Alain Andre; Moinard, Jean Robert; and Raynal, Serge Fernand, 3,890,278.

Razdan, Raj K., to United States of America, Army. 1-(2-(Phenyl-lower-alkyl)-aziridines munition payload. 3,889,600, Cl. 102-90.000.

RCA Corporation: *See—*
Ettenberg, Michael, 3,890,194.
Ham, William Edward; and Flatley, Doris Winifred, 3,890,632.
Harmening, Wayne Arthur, 3,889,551.
Huang, Ho-Chung, 3,890,630.
Kosonocky, Walter Frank, 3,890,633.

Reactor Centrum Nederland: *See—*
Piepers, Gijsbrecht Gerhardus; and Scholtus, Christiaan Gustaaf Adolf, 3,889,438.

Readi Temp, Inc.: *See—*
Donnelly, William R., 3,889,483.

Redrow, Allan Raymond. Hair dressing method and device. 3,889,692, Cl. 132-7.000.

Rees, Alfred: *See—*
Cleaver, Brian William; and Rees, Alfred, 3,889,356.

Rees, Thomas Charles; and Sugerman, Gerald, to Bayer Aktiengesellschaft. Process for the preparation of 2-naphthole from the corresponding tetralin-hydroperoxide and 1,2-dialin. 3,890,397, Cl. 260-621.00H.

Regan, A. Michael; and Watkins, Bruce J., to Regan Offshore International, Inc. Telescopic riser tensioning apparatus. 3,889,747, Cl. 166-.500.

Regan Offshore International, Inc.: *See—*
Regan, A. Michael; and Watkins, Bruce J., 3,889,747.

Regie Nationale des Usines Renault: *See—*
Langlois, Christian, 3,889,541.

Pruvot, Francois C.; Maistrélli, Roger; and Buachet, Pierre, 3,890,360.
Reijnierse, Pieter: *See—*
Beun, Mattijs; and Reijnierse, Pieter, 3,890,596.
Reinsma, Harold L.: *See—*
Boggs, Roger L.; and Reinsma, Harold L., 3,889,550.
Reith, Kurt A., to Textron Inc. End attachment for watch bands. 3,889,323, Cl. 24-265.00B.
Remery, Michel, to U.S. Philips Corporation. Ignition of discharge tubes. 3,890,539, Cl. 315-273.000.
Remond, Jean-Pierre: *See—*
Vitat, Jean-Claude; Thebault, Jean-Robert; and Remond, Jean-Pierre, 3,889,930.
Research Corporation: *See—*
Pytlewski, Louis L., 3,890,429.
White, Eugene W.; Weber, Jon N.; and White, Rodney A., 3,890,107.
Research & Development: *See—*
Malisow, Jack T., 3,889,954.
Restall, George. Animal operated liquid dispenser. 3,889,640, Cl. 119-75.000.
Restaurant Technology, Inc.: *See—*
Binks, Chester J.; and Moser, Joseph M., 3,889,582.
Reuther, Albert: *See—*
von der Eltz, Hans-Ulrich; Lappe, Franz; and Reuther, Albert, 3,889,495.
Reynolds Metals Company: *See—*
Dewey, John L.; Cook, George W.; and Scott, Charles E., 3,890,427.
Siemonsen, Frederik A., 3,889,745.
Rhodes Investment Company: *See—*
Self, Edgar L.; and Gormley, John C., 3,890,058.
Rhone-Poulenc S.A.: *See—*
Chabardes, Pierre; Julia, Marc; and Menet, Albert, 3,890,393.
Rhone-Poulenc-Textile: *See—*
Joly, Jean; and Sangalli, Silvio, 3,889,327.
Rhone-Progil: *See—*
Vitat, Jean-Claude; Thebault, Jean-Robert; and Remond, Jean-Pierre, 3,889,930.
Ribouleau, Edmond. Distributing apparatus for agricultural purposes. 3,889,853, Cl. 222-177.000.
Ricciardi, Michael Anthony; Smudin, David J.; Wagner, Richard D.; Pcolinsky, Michael; and Chaya, John Edward. Rapid cooling process for improving quality of polyurethane foam. 3,890,414, Cl. 264-45.100.
Ricciardi, Ronald J.; and Ferrara, Angelo. Automatically controlled weigh feeding apparatus. 3,889,848, Cl. 222-58.000.
Rice, Joseph Albert. Cot storage cart. 3,889,814, Cl. 211-27.000.
Richardson, Edwin A., to Shell Oil Company. Buffer regulated mud acid. 3,889,753, Cl. 166-307.000.
Richardson-Merrell Inc.: *See—*
Grisar, J. Martin; Claxton, George P.; and Blohm, Thomas R., 3,890,445.
Grunwell, Joyce F.; Johnston, John O.; Petrow, Vladimir; and Weintraub, Philip M., 3,890,356.
Palopoli, Frank P.; and Paolini, John P., 3,890,328.
Riche, Robert M., to Societe Technique et Commercial d'Installations Industrielles "Luceat". Marine loading arm for bunkering vessels. 3,889,728, Cl. 141-387.000.
Richerson, David W., to Norton Company. Hot pressed silicon nitride containing finely dispersed silicon carbide or silicon aluminum oxynitride. 3,890,250, Cl. 252-516.000.
Riddel, John W., to General Motors Corporation. Liquid level sensor. 3,890,478, Cl. 200-84.00R.
Ridonia Wheel, Inc.: *See—*
Owsen, Peter, 3,889,734.
Riley, Patrick F. Method for making a bait bedding composition. 3,889,638, Cl. 119-1.000.
Riley, Travis E.: *See—*
Florian, Eugene F.; Haggard, Samuel E.; and Riley, Travis E., 3,890,606.
Rivers, Robert Leitch, to Mobelec International Limited. Electric pulse generating apparatus. 3,889,650, Cl. 123-148.00E.
Rixon Inc.: *See—*
Stuart, Richard L.; Bhopale, Arvind M.; and Treynor, Paul E., 3,890,581.
Roberson, James H., to Crompton & Knowles Corporation. Method and system for producing blended textile fibrous materials. 3,889,319, Cl. 19-145.500.
Robert Bosch G.m.b.H.: *See—*
Wanner, Karl; Karl, Hubertus; Hansel, Gernot; Bleicher, Manfred; and Schmid, Wolfgang, 3,889,491.
Roberts, Harold Devere. One piece permanent support frame for upper dentures and process of mounting the same. 3,889,375, Cl. 32-10.00A.
Robertshaw Controls Company: *See—*
Brakebill, Harold G.; Lewis, Jay L.; and Berleyoung, Walter J., 3,889,335.
Goodhouse, Carl J., 3,889,875.
Price, Larry V., 3,889,840.
Tyler, Hugh J., 3,889,362.
Robillard, Edward G., to Cincinnati Milacron-Heald Corporation. Grinding machine. 3,890,116, Cl. 51-165.710.
Robin, Allen M.: *See—*
Child, Edward T; and Robin, Allen M., 3,890,113.
Robnolte, Wilber B. Device for facilitating the feeding of sheets into a reproduction machine or the like. 3,889,942, Cl. 271-3.000.
Roche, Francis G., to Cable & Wireless Limited of Smale House. Buffer stores. 3,890,600, Cl. 304-172.500.
Rochfort, William Phillip King. Concrete laying machine. 3,890,055, Cl. 404-84.000.
Rockwell International Corporation: *See—*
Moulton, James A., 3,890,617.
Schrader, Carl N.; and Fisher, Frank H., 3,889,786.
Rode, Daniel Leon: *See—*
DiLorenzo, James Vincent; Niehaus, William Charles; Rode, Daniel Leon; and Schwartz, Bertram, 3,890,215.
Rodia, Ralph M.; and Pews, R. Garth, to Dow Chemical Company, The. 2-Hydroxy-3,4,5-trichlorobenzenesulfonamides. 3,890,383, Cl. 260-556.0AR.
Roerig, Arnold J.: *See—*
Justus, Edgar J.; and Roerig, Arnold J., 3,889,334.
Roessl, Julius. Portable shelter. 3,889,698, Cl. 135-2.000.
Roest, Bernard C.: *See—*
Schepers, Herman A. J.; and Roest, Bernard C., 3,890,408.
Rogers, Roy H., to R & R Products, Inc. Deep-tine aerating machine. 3,889,761, Cl. 172-706.000.
Rohm and Haas Company: *See—*
Davis, Robert L., 3,889,831.
Roller, William G.; and West, Emery L., to Roller, William G. Control cable connection for an electric trolling motor. 3,889,625, Cl. 115-18.00E.
Rolls-Royce (1971) Limited: *See—*
Scott-Scott, John Lanfear, 3,889,622.
Romanov, Georgy Ivanovich: *See—*
Fain, Pavel Ioelievich; Zimin, Vladimir Anatolievich; Strashun, Aron Zakharovich; Isupova, Tamara Ivanovna; Pankratov, Alexandr Ivanovich; and Romanov, Georgy Ivanovich, 3,890,457.
Roquemore, Glenn F.; and Lacy, Roderick B., to Formulabs Industrial Inks, Inc. Apparatus for applying one or more stripes to conductors. 3,889,633, Cl. 118-68.000.
Roquette Freres: *See—*
Huchette, Michel; and Fleche, Guy, 3,890,300.
Rosen Enterprise, Inc.: *See—*
Rosen, William E., 3,889,689.
Rosen, Gerald J.: *See—*
Boyd, Roy W., Jr., 3,889,317.
Rosen, Irving: *See—*
Boyd, Roy W., Jr., 3,889,317.
Rosen, Robert, to United States of America, Navy. Traveling-wave-tube protection circuit. 3,890,545, Cl. 317-51.000.
Rosen, William E., to Rosen Enterprise, Inc. Method of treating tobacco with catalase and hydrogen peroxide. 3,889,689, Cl. 131-140.00P.
Rosenberg, Harry: *See—*
Weirich, Walter; and Rosenberg, Harry, 3,889,481.
Rosenberger, Michael: *See—*
Cohen, Noal; Rosenberger, Michael; and Saucy, Gabriel, 3,890,354.
Rosner, Alexander G.: *See—*
Helms, Horace H., Jr.; and Rosner, Alexander G., 3,890,174.
Ross, Thomas A., to Mayfran Incorporated. Bar feeder. 3,889,822, Cl. 214-1.500.
Ross, William Lawrence: *See—*
LaClair, Louis Maynard; McWhirter, John Ruben; and Ross, William Lawrence, 3,890,231.
Rossier, Jean-Pierre: *See—*
Steinegger, Hans; Glauser, Walter; Rossier, Jean-Pierre; Crausaz, Rene; and Matthey-Doret, Pierre Andere, 3,889,428.
Rostgo International Corporation: *See—*
Stigler, Joseph T., 3,889,726.
Roth, Philip B.: *See—*
Bann, Robert Francis; Moran, William Joseph; and Roth, Philip B., 3,890,095.
Rothi, Robert D.: *See—*
Boehringer, Wilfred E.; Little, Jane; Rothi, Robert D.; and Westlund, Charles G., 3,890,064.
Rowland, Roger Gilbert: *See—*
Osborne, Geoffrey Vaughan; and Rowland, Roger Gilbert, 3,889,299.
Royal Industries, Inc.: *See—*
Miller, Leslie R.; and McKenney, John D., 3,889,343.
Rubin, Isaac D.; Love, Richard F.; and Holder, Charles B., to Texaco Inc. Process for preparation of aminoesters. 3,890,357, Cl. 260-404.000.
Rubino, Vito Michael. Vacuum siphon pump. 3,889,704, Cl. 137-123.000.
Ruckert, Hans; and Unholz, Rainer, to Hoechst Aktiengesellschaft. Light-sensitive copying composition containing diazo resin and quinone diazide. 3,890,152, Cl. 96-75.000.
Rudin, Morton: *See—*
Hagen, William B.; and Rudin, Morton, 3,890,598.
Ruegg, Heinz Walter, to U.S. Philips Corporation. Transistor circuit. 3,890,634, Cl. 357-40.000.
Ruggeri, Mariano Vecchio: *See—*
Sapino, Chester, Jr.; and Ruggeri, Mariano Vecchio, 3,890,310.
Ruppert, Jurgen: *See—*
Eder, Ulrich; Haffer, Gregor; Ruppert, Jurgen; Sauer, Gerhard; and Wiechert, Rudolf, 3,890,391.

Rush, David H., to Chromalloy Electronics Div. Chromalloy American Corp. Illuminated safety pole for bicycles or the like. 3,890,497, Cl. 240-7.550.

Rush-Hampton, Inc.: *See—*
Harich, Jakob; and Harich, Franz P., 3,890,212.

Rush, William F.; Wurm, Jaroslav; and Dufour, Raymond J., to Gas Developments Corporation. Air conditioning apparatus and method. 3,889,742, Cl. 165-7.000.

Russ, Malcolm J., to Motorola, Inc. Method of making a multicolor light display by graded mesaing. 3,890,170, Cl. 148-175.000.

Russell, Ronald William, to New Zealand Dairy Research Institute; and New Zealand Dairy Board. Apparatus for packaging extrudable material. 3,889,448, Cl. 53-122.000.

Rycom Instruments: *See—*
Buenger, George L., 3,890,490.

S.A. des Anciens Etablissements Paul Wurth: *See—*
Legille, Edouard; and Mahr, Rene N., 3,889,791.

S.P.A.M.: *See—*
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Saes Getters S.p.A.: *See—*
Porta, Paolo Della; Ferrario, Bruno; Cantaluppi, Angelo; Montalenti, Paolo; and Giorgi, Fiziano A., 3,890,104.

Safety Research & Engineering Corporation: *See—*
Barabino, William A., 3,890,595.

Saffir, Jacob A., to Dentsply Research & Development Corporation. Dental prosthetic appliance. 3,889,374, Cl. 32-2.000.

Saiki, Atsushi: *See—*
Harada, Seiki; Saiki, Atsushi; Okabe, Takahiro; and Sato, Kikuji, 3,890,636.

St. Eve, Daniel Robert, to Leco Industries Limited. Extrusion devices. 3,890,083, Cl. 425-462.000.

Saito, Teruo: *See—*
Matsunaga, Hiroomi; Okumura, Takuzo; Takata, Isao; and Saito, Teruo, 3,890,406.

Saito, Tsutomu, to Three Bond Co. Ltd. Anaerobically curable sealing composition containing 2,2-bis(4-acryloxy-alkoxy phenyl) propane. 3,890,273, Cl. 260-47.0UA.

Sakai, Satoshi; Shimizu, Norio; and Nomura, Junji, to Matsushita Electric Works, Ltd. Electric dry shaver blade assembly. 3,889,372, Cl. 30-43.600.

Sakashita, Hitoshi: *See—*
Uozake, Seizo; and Sakashita, Hitoshi, 3,889,615.

Sakurada, Ichio: *See—*
Ito, Shunji; Morioka, Yasuaki; Kajinaga, Yoshihiro; Nitta, Minoru; and Sakurada, Ichio, 3,890,136.

Salakari, Martti. Vehicle-tire stud with relatively movable parts. 3,889,735, Cl. 152-210.000.

Sammons, Herbert F.: *See—*
Lindsey, L. E.; and Sammons, Herbert F., 3,889,911.

Sams, Bernard. Label dispensing and applying apparatus. 3,890,188, Cl. 156-384.000.

Samsonite Corporation: *See—*
Joseph, Mark T., 3,889,859.

Sanders Associates, Inc.: *See—*
Mayo, Kenneth E., 3,889,522.
McCarthy, Brian Dennis; and Krause, Anthony Victor, 3,890,541.

Sanderson, Andrew G. Refractory furnace. 3,890,090, Cl. 432-250.000.

Sandlin, Felix M.: *See—*
Waller, Jack Douglas; Limmer, Bobby Lee; and Sandlin, Felix M., 3,889,681.

Sandoz, Inc.: *See—*
Anderson, Paul L., 3,890,396.
Hardtmann, Goetz E., 3,890,350.
Kathawala, Faizulla G., 3,890,348.

Sandoz Ltd.: *See—*
Mayerhoefer, Horst; Mueller, Wolfgang; Soliberger, Urs; and Wolf, Rainer, 3,890,409.

Sanford, Harry W., to T. D. E. Inc. Automatic hand gun. 3,889,574, Cl. 89-169.000.

Sangalli, Silvio: *See—*
Joly, Jean; and Sangalli, Silvio, 3,889,327.

Sangamo Weston Limited: *See—*
Dawson, Gordon William; and Dixon, Howard Meredith, 3,890,162.

San Miguel, Anthony, to United States of America, Navy. Stress relieving liner. 3,889,463, Cl. 60-255.000.

Sanyu Kosan Kabushiki Kaisha: *See—*
Sugita, Toshio, 3,889,508.

Sapienza, Salvatore. Occupant propelled swing. 3,889,944, Cl. 272-90.000.

Sapino, Chester, Jr.; and Ruggeri, Mariano Vecchio, to Bristol-Myers Company. Methoxymethyl 3-methyl-7-β-phenoxyacetamido-ceph-3-em-4-carboxylate. 3,890,310, Cl. 260-243.00C.

Sargent Industries, Inc.: *See—*
Smith, Fred T., 3,889,828.

Sarnoff, Stanley J.: *See—*
Dovey, Brian H.; Bartner, Elliot; Kaplan, Sheldon; and Sarnoff, Stanley J., 3,889,673.

Sasajima, Kikuo: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Sasajima, Kikuo; Nakao, Masaru; Maruyama, Isamu; Ono, Keiichi; and Katayama, Shigenari, 3,890,323.

Sasaki, Rentaro; Watanabe, Akinori; Ogasawara, Tatsuo; and Sogabe, Hidetoshi, to Oki Electric Industry Co., Ltd.; and Okaya Electric Industry Co., Ltd. Low voltage cold cathode discharge type display devices with metal oxide cathode and phosphor anode matrix. 3,890,609, Cl. 340-324.00M.

Sasame, Takao; Takahashi, Kentaro; Nakamura, Yoshikatsu; and Miura, Kazumasa, to Nippon Piston Ring Co., Ltd. Relative combination of an apex seal and a rotor housing in the rotary engine. 3,890,070, Cl. 418-.

Sasame, Takao: *See—*
Shigeta, Toshihiko; Yamada, Toshio; Sasame, Takao; and Uebayashi, Yoshitaka, 3,890,209.

Sato, Akira: *See—*
Nakamura, Yasuharu; Nakazawa, Yoshiyuki; Sueyoshi, Tohru; and Sato, Akira, 3,890,155.

Sato, Hironari: *See—*
Kobayashi, Reisuke; Sato, Hironari; Takita, Kiyoshi; and Toyama, Nobuo, 3,890,198.

Sato, Kikuji: *See—*
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Sato, Masao; Aizawa, Tsuneo; Ohnishi, Kenji; Koizumi, Shigeo; Fukuda, Akio; Kikuchi, Shinki; and Kusanagi, Shichiro, to Amada Company Limited. Horizontal band saw machine. 3,889,561, Cl. 83-58.000.

Sato, Masso; Aizawa, Tsuneo; Ohnishi, Kenji; Koizumi, Shigeo; Fukuda, Akio; Kikuchi, Shinki; and Kusanagi, Shichiro, to Amada Company Limited. Horizontal band saw machine. 3,889,567, Cl. 83-818.000.

Satow, Haruhiko: *See—*
Shimoji, Masaharu; Satow, Haruhiko; and Kawano, Tetsuo, 3,889,643.

Saucy, Gabriel: *See—*
Cohen, Noal; Rosenberger, Michael; and Saucy, Gabriel, 3,890,354.

Sauer, Elmer E. Patio serving cart. 3,889,967, Cl. 280-47.350.

Sauer, Gerhard: *See—*
Eder, Ulrich; Haffer, Gregor; Ruppert, Jurgen; Sauer, Gerhard; and Wiechert, Rudolf, 3,890,391.

Saunders, James F., to Maytag Company, The. Control device. 3,890,477, Cl. 200-83.00P.

Savage, Kerry D.: *See—*
Dowling, Donald J.; and Savage, Kerry D., 3,890,563.

Savet, Paul: *See—*
Kamins, Jerome H.; Mandell, Michael I.; Armen, Harry, Jr.; and Savet, Paul, 3,890,484.

Saville, Eric J.; and Hunt, Raymond S., Jr., to PneuDraulics, Inc. Leakage resistant fitting. 3,889,923, Cl. 251-170.000.

Sawa, Kiyohiko, to Kobe Steel, Ltd. Apparatus for pulverizing vulcanized rubber and rubber products. 3,889,889, Cl. 241-228.000.

Sawada, Yasunori: *See—*
Iwata, Hiroshi; Sawada, Yasunori; and Yamaoka, Tetsuo, 3,890,538.

Sawitz, Michael: *See—*
Kranenberg, Helmut; and Sawitz, Michael, 3,889,507.

Say, Donald L.; and Smithgall, Harry E., to GTE Sylvania Incorporated. Common focusing electrode for plurality of beams and having same plurality of internal shields. 3,890,528, Cl. 313-414.000.

Scandaletos, Lazare, to S.P.A.M. Abrasive tools. 3,889,430, Cl. 51-206.0NF.

Scans Associates, Inc.: *See—*
Grikscheit, Henry W.; and Converse, Vernon G., III, 3,889,528.

Schade, Gerhard: *See—*
Blaschke, Franz; Gardziella, Arno; and Schade, Gerhard, 3,890,186.

Schaefer, William H.; and Bender, Richard E., to General Dynamics Corporation. Laminated reinforcing facing for a game racket. 3,889,951, Cl. 273-73.00F.

Schaffner, Gus J., III, to Schaffner Mfg. Co., Inc. Flap wheel finishing device. 3,890,119, Cl. 51-334.000.

Schaffner Mfg. Co., Inc.: *See—*
Schaffner, Gus J., III, 3,890,119.

Schatz, Oskar: *See—*
Brandis, Curt; and Schatz, Oskar, 3,889,932.

Schawartz, Jozsef, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara RT. Process for the preparation of d-(−)-2-amino-2-(p-hydroxyphenyl)-acetic acid. 3,890,379, Cl. 260-519.000.

Scheerhorn, Douglas: *See—*
Mohr, Robert G.; Hodges, Ronald R.; Hockenberry, Jack; Scheerhorn, Douglas; and Wilcox, Gale F., 3,890,023.

Scheffer, Dietrich: *See—*
Boden, Karl; and Scheffer, Dietrich, 3,890,019.

Scheinpflug, Hans: *See—*
Kuhle, Engelbert; Klauke, Erich; Hamburger, Brigitte; and Scheinpflug, Hans, 3,890,386.

Schellhammer, Carl-Wolfgang: *See—*
Knupfer, Hans; and Schellhammer, Carl-Wolfgang, 3,890,364.

Schendel, Donald D., Jr.: *See—*
Kuhn, Harry A., Jr.; and Schendel, Donald D., Jr., 3,890,580.

Schenker, Karl; and Bernasconi, Raymond, to Ciba-Geigy Corporation. Pharmaceutical preparations and method of use. 3,890,441, Cl. 424-267.000.

Schepers, Herman A. J.; and Roest, Bernard C., to Stamicarbon, N.V. Process for preparing block copolymers. 3,890,408, Cl. 260-879.000.

Schering AG: *See—*
Puttner, Reinhold; and Arndt, Friedrich, 3,890,385.

Schering Aktiengesellschaft: *See—*
Eder, Ulrich; Haffer, Gregor; Ruppert, Jurgen; Sauer, Gerhard; and Wiechert, Rudolf, 3,890,391.

Schettl, Alvin J.: *See—*
Kauranen, Herbert A.; and Schettl, Alvin J., 3,889,654.

Schiesser AG: *See—*
Schiesser, Walter Hugo, 3,889,562.

Schiesser, Walter Hugo, to Schiesser AG. Installation for piece-by-piece throughput of rolled rubber sheets out of a cooling unit. 3,889,562, Cl. 83-94.000.

Schimelpfenig, Clarence William, to du Pont de Nemours, E. I., and Company. Ring chlorination of ortho-toluidine. 3,890,388, Cl. 260-578.000.

Schindler, Walter, deceased: *See—*
Zust, Armin; Schindler, Walter, deceased; and Gysin, Leonhard, executor, 3,890,439.

Schlapfer, Hans: *See—*
Weber, Kurt; and Schlapfer, Hans, 3,890,305.

Schlesinger, Sheldon Irwin; Boszak, Ronald J.; Shuppert, Laurence Verlan; and Cowling, Richard James, to American Can Company. Waterless diazo planographic printing plates with epoxy-silane in undercoat and/or overcoat layers. 3,890,149, Cl. 96-33.000.

Schlicht, Raymond C.: *See—*
McCoy, Frederic C.; and Schlicht, Raymond C., 3,890,219.

Schliebs, Reinhard: *See—*
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Schlumberger Technology Corporation: *See—*
Houot, Georges Sylvain, 3,889,307.
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Schmalbach-Lubeca GmbH: *See—*
Lorenzen, Uwe J.; and Martens, Harald, 3,889,617.

Schmid, Ronald F., to Minnesota Mining and Manufacturing Company. Magnetic document encoder having multiple staggered styli. 3,890,623, Cl. 346-74.100.

Schmid, Wolfgang: *See—*
Wanner, Karl; Karl, Hubertus; Hansel, Gernot; Bleicher, Manfred; and Schmid, Wolfgang, 3,889,491.

Schmidlin, Fred W., to Xerox Corporation. Induction imaging apparatus. 3,890,040, Cl. 355-16.000.

Schmidt, John C.: *See—*
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Schmidt, Klaus H.: *See—*
Hart, Edwin J.; Vasudevan, Keelathur N.; and Schmidt, Klaus H., 3,890,046.

Schmidt, Robert Rudolf: *See—*
Hofer, Wolfgang; Schliebs, Reinhard; Schmidt, Robert Rudolf; and Eue, Ludwig, 3,890,382.

Schmiesing, Gregory E. Automatic hitching device. 3,889,979, Cl. 280-446.00R.

Schneider, Gerhart: *See—*
Diery, Helmut; Hess, Peter; Schneider, Karl-Heinz; and Schneider, Gerhart, 3,890,093.

Schneider, Karl-Heinz: *See—*
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Schneider, William P.: *See—*
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Schnitzer, Emanuel, to Frontier Engineering Corporation; and H. B. Zachry Company, part interest to each. Rotary desalination engine and system. 3,890,205, Cl. 202-236.000.

Schoeck, Vincent E., to Carborundum Company, The. Filter bag. 3,890,125, Cl. 55-381.000.

Scholtes, Lorin H. Retractable scoop for catching machined parts. 3,889,559, Cl. 82-2.500.

Scholtus, Christiaan Gustaaf Adolf: *See—*
Piepers, Gijsbrecht Gerhardus; and Scholtus, Christiaan Gustaaf Adolf, 3,889,438.

Schoneck, Clarence E. Automatically operating truck end gate steps. 3,889,997, Cl. 296-62.000.

Schott, Lawrence A.: *See—*
Schott, Roger A.; and Schott, Lawrence A., 3,889,781.

Schott, Roger A.; and Schott, Lawrence A. Fixture for cable lubricating device. 3,889,781, Cl. 184-15.00R.

Schrader, Carl N.; and Fisher, Frank H., to Rockwell International Corporation. Brake drum cooling structure. 3,889,786, Cl. 188-218.00R.

Schroder, Klaus. Selective dipole orientation of individual volume elements of a solid body. 3,890,604, Cl. 340-173.200.

Schroeder, Heinz-Jurgen: *See—*
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Schue, Francois: *See—*
Lehn, Jean-Marie; Schue, Francois; Boileau, Sylvie; Kaempf, Bernd; Cau, Alain Andre; Moinard, Jean Robert; and Raynal, Serge Fernand, 3,890,278.

Schwartz, Bertram; Spitzer, Stuart Marshall; and Weigle, Gregory Dyett, to Bell Telephone Laboratories, Incorporated. Method of forming stable native oxide on gallium arsenide based compound semiconductors by combined drying and annealing. 3,890,169, Cl. 148-187.000.

Schwartz, Bertram: *See—*
DiLorenzo, James Vincent; Niehaus, William Charles; Rode, Daniel Leon; and Schwartz, Bertram, 3,890,215.

Schwarzinger, Ernst: *See—*
Obendorf, Werner; Lindner, Irmgard; Schwarzinger, Ernst; and Krieger, Josef, 3,890,318.

Schwenk, George B. Accident responsive automatic ignition cut-off switch. 3,889,774, Cl. 180-104.000.

Schwenker, Robert Frederick, Jr.: *See—*
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Sciulli, Joseph A., to Communications Satellite Corporation. Digital voice switch for use with delta modulation. 3,890,467, Cl. 179-1.0VC.

Scogin, Clifford A. Wood burning heater. 3,889,653, Cl. 126-110.00R.

Scott, Charles E.: *See—*
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Scott, Kenneth C.; and Seilly, Alec Harry, to Simms Group Research & Development Limited. Weighing devices. 3,889,767, Cl. 177-136.000.

Scott Paper Company: *See—*
Buhayar, Eric S.; and Gerstenkorn, Gordon F., 3,889,424.

Scott-Scott, John Lanfear, to Rolls-Royce (1971) Limited. Marine propulsion. 3,889,622, Cl. 115-11.000.

Scovill Manufacturing Company: *See—*
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Scozzie, James A.: *See—*
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Searle Cardio-Pulmonary Systems Inc.: *See—*
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Seidel, Ingo: *See—*
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Seifert, Eberhard, to Sulzer Brothers Ltd. Weaving machine for producing terry cloth. 3,889,719, Cl. 139-25.000.

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Scott, Kenneth C.; and Seilly, Alec Harry, 3,889,767.

Seko, Seido: *See—*
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Self, Edgar L.; and Gormley, John C., to Rhodes Investment Company. Drill guiding apparatus. 3,890,058, Cl. 408-112.000.

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Selke, Donald A.: *See—*
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Sempei, Suzuki, to Suntory Limited. Machine for producing circular products. 3,889,731, Cl. 147-36.000.

Senecal, William J., to Gulf & Western Manufacturing Company. Brake drum and disc micrometer. 3,889,378, Cl. 33-143.00R.

Serini, Volker; Vernaleken, Hugo; and Cohnen, Wolfgang, to Bayer Aktiengeselischaft. Polycarbonate mixtures. 3,890,266, Cl. 260-37.0PC.

Serup, Alfred. Parachute drying apparatus. 3,889,389, Cl. 34-15.000.

Servomed Arzneimittel GmbH: *See—*
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Setecka, John C. Portable adjustable tee and ball positioning device. 3,889,946, Cl. 273-33.000.

Shaffer, John Richard, to Western Electric Company, Incorporated. Method and apparatus for forming a tubular billet about a mandrel using multi-directional stress. 3,889,506, Cl. 72-60.000.

Sharp, Mark Edward, to Texas Instruments Incorporated. Workpiece alignment system. 3,890,508, Cl. 250-548.000.

Shatney, Robert H., to Dow Chemical Company, The. Permeable meat casings. 3,890,447, Cl. 426-105.000.

Sheffer Corporation, The: *See—*
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Sheffer, Harvey I.; and Selke, Donald A., to Sheffer Corporation, The. Locking cylinder with improved locking structure. 3,889,576, Cl. 91-394.000.

Shell Oil Company: *See—*
Isaac, Eirlys R.; and Kirby, Peter, 3,890,352.
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Shelver, Lyle N. Thermal glass structural device. 3,889,434, Cl. 52-172.000.

Sheppard, Chester Stephen; and MacLeay, Ronald Edward, to Pennwalt Corporation. Azo containing polybutadienes. 3,890,294, Cl. 260-94.70N.

Sherritt Gordon Mines Limited: *See—*
Postma, Peter, 3,889,776.

Shiba, Seiichro: *See—*
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Shibata, Akira, to Chugai Denkikogyo Kabushiki Kaisha. Method for producing electric contacts made of internally oxidized silver alloy. 3,889,366, Cl. 29-630.00C.

Shidara, Keiichi: *See—*
Hirai, Tadaaki; Maruyama, Eiichi; Inao, Kiyohisa; Yamamoto, Hideaki; Goto, Naohiro; Isozaki, Yukinao; Shidara, Keiichi; and Uchida, Teruo, 3,890,525.

Shiga, James T. Game with puck launching means and goal tender. 3,889,952, Cl. 273-121.00R.

Shigeta, Masayuki: *See—*
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Shigeta, Toshihiko; Yamada, Toshio; Sasame, Takao; and Uebayashi, Yoshitaka, to Toyo Kogyo Co., Ltd. Abrasion resistant mechanical member with composite nickel-plating layer having meshlike porous portion and a method for manufacture thereof. 3,890,209, Cl. 204-16.000.

Shim, Kyung Sup, to Stauffer Chemical Company. Process for forming phosphorus containing polymers. 3,890,411, Cl. 260-969.000.

Shimada, Keizo; Nishikawa, Takeo; Harada, Toshiaki; and Nagahama, Shizuo, to Teijin Limited. Process for separating and recovering 2,6-dimethylnaththalenes. 3,890,403, Cl. 260-674.00N.

Shimizu, Kazuya, to Barry Wright Corporation. Combined air mounts. 3,889,936, Cl. 267.65 R-.

Shimizu, Norio: *See—*
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Shimoji, Masaharu; Satow, Haruhiko; and Kawano, Tetsuo, to Toyo Kogyo Co., Ltd. Fuel injection-type rotary piston engine. 3,889,643, Cl. 123-8.090.

Shinto Kogyo Kabushiki Kaisha: *See—*
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Shionogi & Company, Ltd.: *See—*
Shoji, Jun'Ichi; Mayama, Mikao; Matsuura, Shinzo; Matsumoto, Kouichi; and Wakisaka, Yoshiharu, 3,890,436.

Shiota, Hiroshi: *See—*
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Shoji, Jun'Ichi; Mayama, Mikao; Matsuura, Shinzo; Matsumoto, Kouichi; and Wakisaka, Yoshiharu, to Shionogi & Company, Ltd. Antibiotic GP-3 and production thereof by cultivation of *bacillus cereus*. 3,890,436, Cl. 424-118.000.

Shoketsu Kinzoku Kogyo Kabushiki Kaisha: *See—*
Kuga, Atsushi, 3,890,123.

Short, John R. Controller for automatic pinsetter. 3,889,947, Cl. 273-43.00A.

Shroff, Arvind, to Thomson-CSF. X-ray tube target and X-ray tubes utilising such a target. 3,890,521, Cl. 313-55.000.

Shugart Associates: *See—*
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Shughart, Mervin Leonard, to AMP Incorporated. Locator for applicators adapted to apply electrical connectors to printed circuit boards. 3,889,337, Cl. 29-203.00B.

Shulzhenko, Alexandr Alexandrovich: *See—*
Bakul, Valentin Nikolaevich; Shulzhenko, Alexandr Alexandrovich; and Getman, Anatoly Fedorovich, 3,890,430.

Shumway, Harold A. Exothermic welding composition. 3,890,168, Cl. 148-24.000.

Shuppert, Laurence Verlan: *See—*
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Siddall, John B.: *See—*
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Sidi, Henri; and Johnson, Hilding R., to Tenneco Chemicals, Inc. Surface-coating compositions containing polyoxymethyleneoxazolidines. 3,890,264, Cl. 260-29.6HN.

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Sien Equipment Company: *See—*
Sien, Gerald Bruce, 3,890,005.

Sien, Gerald Bruce, to Sien Equipment Company. Articulated frame mine dumper. 3,890,005, Cl. 298-22.00P.

Silverman, Ira; and Irvine, James M., to Computer Peripherals, Inc. Ribbon drive and control system. 3,889,893, Cl. 242-57.100.

Simjian, Luther G., to Command Automation, Inc. Arrangement for protecting and authenticating a document. 3,890,599, Cl. 340-149.00R.

Simmons, Walter John; and Willis, Frank Marsden, to du Pont de Nemours, E. I., and Company. Process for forming partitioned film packages and apparatus for use therein. 3,889,446, Cl. 53-28.000.

Simms Group Research & Development Limited: *See—*
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Simon, Alvin L.; and Butz, Klaus S., to Advanced Chemical Technology. Blow-molded drum. 3,889,839, Cl. 220-72.000.

Simplex Time Recorder Company: *See—*
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Simpson Manufacturing Co., Inc.: *See—*
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Sinclair, Brett Jason; and Youngelson, Harold. Roller transmission. 3,889,554, Cl. 74-798.000.

Singerman, Gary M., to Gulf Research & Development Company. Preparation of 2,1-benzisothiazoles. 3,890,340, Cl. 260-304.000.

Sionczewski, John Casimir, to International Business Machines Corporation. Magnetic domain systems using domains having different properties. 3,890,605, Cl. 340-174.0TF.

Sir Howard Grubb Parsons & Co., Limited: *See—*
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Sittner, Edward H., Jr.; and Girard, Robert R., to ACF Industries, Incorporated. Brake lever system for railway cars. 3,889,783, Cl. 188-52.000.

Skil Corporation: *See—*
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Skoglund, Eric; and Jarleborg, Olle, to Nyby Bruk AB. Welded constructions of stainless steels. 3,890,143, Cl. 75-125.000.

Slater, Willard C., to Universal Plastic Pipe Bending Corporation. Automatic machine for bending and flaring quantities of plastic pipe. 3,890,079, Cl. 425-155.000.

SM Maschinenfabrik Herbert Stahl: *See—*
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Smith, Fred T., to Sargent Industries, Inc. Noise reduction apparatus and method. 3,889,828, Cl. 214-83.300.

Smith, Peter John: *See—*
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Smith, Richard C., to Wright Manufacturing Company. Articulated two-part prosthesis replacing the ankle joint. 3,889,300, Cl. 3-1.910.

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Smith, Robert E.; and Carter, Leroy C., to Westinghouse Electric Corporation. Bearing lubrication system. 3,890,021, Cl. 308-126.000.

Smith, Susan L.; and Dorman, Douglas E., to Eli Lilly and Company. Leurocolombine. 3,890,325, Cl. 260-287.00R.

Smith, Thomas R.: *See—*
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Smith, Willoughby Arthur. Coating of substrates with particle materials. 3,889,636, Cl. 118-621.000.

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Societe Anonyne dite: L'Oreal: *See—*
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Societe d'Exploitation des Brevets OCLAUR: *See—*
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Societe Nationale des Poudres et Explosifs: *See—*
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Societe Nouvelle Siplast: *See—*
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Speiser, Jeffrey M., to United States of America, Navy. Bessel sequence echo-location system. 3,890,618, Cl. 343-17.10R.

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Spinner, Georg; and Pitschi, Franz X. Means for sealing the crimped end portion of a wave guide. 3,890,584, Cl. 333-98.00R.

Spitzer, Stuart Marshall: *See—*
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Spivey, Jene D. Portable waste glass bottle and container crushing device. 3,889,886, Cl. 241-100.000.

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Stahl, Herbert, to SM Maschinenfabrik Herbert Stahl. Backing wheel for a belt grinder. 3,890,115, Cl. 51-135.00R.

Stamicarbon, N.V.: *See—*
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Standard Oil Company: *See—*
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Stanley Works, The: *See—*
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Stapfer, Christian H., to Cincinnati Milacron Chemicals Inc. Synergistic combinations of organic stabilizers for halogenated resins. 3,890,276, Cl. 260-45.75S.

Stapp, Paul R., to Phillips Petroleum Company. Oligomerization process. 3,890,402, Cl. 260-668.00F.

Starbuck, Herman S. Trash burner conversion unit. 3,889,611, Cl. 110-18.00R.

Statler, Lowell E. Friction-type shock absorber. 3,889,937, Cl. 267-9.00C.

Stauffer Chemical Company: *See—*
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Steigerwald, Robert L.: *See—*
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Steinegger, Hans; Glauser, Walter; Rossier, Jean-Pierre; Crausaz, Rene; and Matthey-Doret, Pierre Andere, to Establissments Sim S.A. Surface grinding machine including work feed, delivery, and measurement means. 3,889,428, Cl. 51-112.000.

Stent, Vernon Dennis; and Wright, Derek Cecil, to Creators Limited. Flexible plastics hoses. 3,890,181, Cl. 156-143.000.

Stephen, Erwin A., to Eli Lilly and Company. Process for increasing the bulk density of salts of 2-(3-phenoxyphenyl)propionic acid. 3,890,380, Cl. 260-520.000.

Stephens, Frank M., Jr.: *See—*
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Stevens, Don L.: *See—*
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Stevens, Douglas; Forberg, Helge O.; Jennings, Larry D.; Stephens, Frank M., Jr.; and Bowen, Francis J., to Southwire Company; National Steel Corporation; and Earth Sciences, Inc. Method of treating alunite ore. 3,890,426, Cl. 423-127.000.

Stevens, John: *See—*
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Stevens, Peter; and Lurie, George R., to Oxy Metal Industries Corporation. Method and electrolyte for electroplating rhodium-rhenium alloys. 3,890,210, Cl. 204-43.00N.

Stewart, James M., to Stewart Research, Inc. Suction-irrigator. 3,889,675, Cl. 128-240.000.

Stewart Research, Inc.: *See—*
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Steyer, William: *See—*
Hull, Thomas Neil, Jr.; Nye, James Leroy; and Steyer, William, 3,889,882.

Stier, Otto; and Kuhn, Heinz, to Vollmer Werke Maschinenfabrik GmbH. Apparatus for hard facing saw blade teeth. 3,889,741, Cl. 164-332.000.

Stigler, Joseph T., to Rostgo International Corporation. Container filling machine. 3,889,726, Cl. 141-142.000.

Stockwell, Orville E. Beet door operator. 3,890,006, Cl. 298-23.00D.

Stoeberl, Helmut. Moulding of shells. 3,889,918, Cl. 249-85.000.

Stoferle, Theodor; and Bellmann, Bernhard. Fluidic system for monitoring machine tool wear during a machining operation. 3,889,520, Cl. 73-37.500.

Stokes, John B.: *See—*
Noneman, Thomas S.; Smith, Thomas R.; and Stokes, John B., 3,890,024.

Storace, Anthony: *See—*
Manduley, Flavio M.; and Storace, Anthony, 3,890,492.

Stouffer, Wilfred. Safety door hinge. 3,889,315, Cl. 16-178.000.

Stover, Raymond W.: *See—*
North, Arthur J.; and Stover, Raymond W., 3,889,637.

Strack, Hans Josef, to Jagenberg Werke AG. Labeling machine with container for transport of stacked labels. 3,889,846, Cl. 221-79.000.

Straley, James M.; and Clark, Gary T., to Eastman Kodak Company. Process for the production of methine dyes. 3,890,307, Cl. 260-240.00E.

Strashun, Aron Zakharovich: *See—*
Fain, Pavel Ioelievich; Zimin, Vladimir Anatolievich; Strashun, Aron Zakharovich; Isupova, Tamara Ivanovna; Pankratov, Alexandr Ivanovich; and Romanov, Georgy Ivanovich, 3,890,457.

Straumanis, Maris A., to Industrial Nucleonics Corporation. Noninteracting extruder control. 3,890,078, Cl. 425-141.000.

Strecker, William V., to Peck & Hale, Inc. Adjustable link. 3,890,053, Cl. 403-44.000.

Street, Vern A.: *See—*
Meshek, Harry M.; and Street, Vern A., 3,890,494.

Strefford, Peter. Container safety dispensing closure. 3,889,852, Cl. 222-153.000.

Strenglein, Harry F., to Sperry Rand Corporation. High conversion efficiency harmonic mixer. 3,890,573, Cl. 325-451.000.

Strong, Jerry G., to Mobil Oil Corporation. N-[3-(4-methyl-3-cyclohexenyl)butyl]amines. 3,890,384, Cl. 260-563.00R.

Structural Materials: *See—*
Pitt, Norman, 3,889,608.

Stuart, Alexander: *See—*
Wood, Hamish Christopher Swan; Stuart, Alexander; Curran, Adrian Charles Ward; and Al-hassan, Saieba, 3,890,387.

Stuart, Richard L.; Bhopale, Arvind M.; and Treynor, Paul E., to Rixon Inc. Digital FM (FSK) modulator. 3,890,581, Cl. 332-11.00R.

Studeneer, Adolf: *See—*
Horlein, Gerhard; Studeneer, Adolf; Langeluddeke, Peter; and Schwerdtle, Friedhelm, 3,890,344.

Stull, James T., to United States Steel Corporation. Bearing construction for idler rolls and maintenance method for idler roll bearings. 3,890,016, Cl. 308-1.00R.

Sturm, Walter H., to Original Hanau Quarzlampen GmbH. Apparatus for controlling the absorption of dye components in a fluid. 3,890,510, Cl. 250-565.000.

Sueyoshi, Tohru: *See—*
Nakamura, Yasuharu; Nakazawa, Yoshiyuki; Sueyoshi, Tohru; and Sato, Akira, 3,890,155.

Suga, Nagaichi. Weathering test apparatus. 3,889,531, Cl. 73-150.00R.

Sugerman, Gerald: *See—*
Rees, Thomas Charles; and Sugerman, Gerald, 3,890,397.

Sugita, Toshio, to Sanyu Kosan Kabushiki Kaisha. Pole bending apparatus. 3,889,508, Cl. 72-215.000.

Suhr, Robert G.: *See—*
Beck, James R.; and Suhr, Robert G., 3,890,337.

Sulzer Brothers Ltd.: *See—*
Seifert, Eberhard, 3,889,719.

Sumita, Masujiro; and Mori, Masatoshi, to Toyo Ink Manufacturing Co., Ltd.; and Nippon Oil Co., Ltd. Printing ink compositions. 3,890,285, Cl. 260-78.5BB.

Sumitomo Chemical Co., Ltd.: *See—*
Matsunaga, Hiroomi; Okumura, Takuzo; Takata, Isao; and Saito, Teruo, 3,890,406.
Takagi, Kazumi; and Matsuda, Teruo, 3,890,404.
Yamamoto, Hisao; Inaba, Shigeho; Sasajima, Kikuo; Nakao, Masaru; Maruyama, Isamu; Ono, Keiichi; and Katayama, Shigenari, 3,890,323.

Sumner, Brian, to Dobson Park Industries Limited. Rock breaking machine. 3,889,762, Cl. 173-139.000.

Sun, Jun-Kai; and Lo, Lian-Sheng. Hydraulically selectable gear transmission. 3,889,547, Cl. 74-336.000.

Sun Oil Company: *See—*
Dycus, Dale W.; Malmberg, Earl W.; and Wilchester, Harry L., 3,890,239.

Sun Oil Company of Pennsylvania: *See—*
Fingerle, Alfred A., 3,889,538.

Sun Ventures, Inc.: *See—*
Angstadt, Howard P.; and Bare, John P., 3,890,281.

Sunds Aktiebolag: *See—*
Wiklund, Olof Bruno, 3,889,584.

Suntory Limited: *See—*
Sempei, Suzuki, 3,889,731.

Survival Technology, Inc.: *See—*
Dovey, Brian H.; Bartner, Elliot; Kaplan, Sheldon; and Sarnoff, Stanley J., 3,889,673.

Suss, Winfried, to Karl Suss KG. Lead-screw-fine adjustment drive for a slide. 3,889,544, Cl. 74-89.150.

Sutliff, Wayne N.; and Downen, Jim. Deep well drilling jar. 3,889,766, Cl. 175-297.000.

Sutter, Melville B. Sill anchoring means. 3,889,440, Cl. 52-714.000.

Suzuki, Fumio; Hayashi, Mamoru; Kawakami, Ikuo; Motohashi, Fujio; and Iwabuchi, Yoshiki, to Nissan Chemical Industries, Ltd. Certain thiazoles containing phosphorus acid esters. 3,890,336, Cl. 260-302.00E.

Suzuki, Takashi; and Tachimoto, Kazuo, to Mitsubishi Kizoku Kabushiki Kaisha. Continuous process for refining sulfide ores. 3,890,139, Cl. 75-74.000.

Suzuki, Takeshi; Tanaka, Hiroshi; and Akiyama, Masanori, to Tokyo Shibaura Electric Co., Ltd. Method for making electroluminescent screens for color cathode-ray tubes of continuous phosphor stripes. 3,890,151, Cl. 96-36.100.

Suzuki, Yasuzo: *See—*
Hasegawa, Masaki; Nakanishi, Fusae; Nakanishi, Hachiro; Watanabe, Shoji; Suzuki, Yasuzo; Nakane, Hisashi; Aoyama, Toshimi; Komatsubara, Yukio; Nojima, Setsuo; and Tagami, Hiroshi, 3,890,150.

Svensson, Karl-Erik: *See—*
Nordblad, Sven Sigurd; and Svensson, Karl-Erik, 3,890,566.

Swanson, Kenneth B.: *See—*
Huffman, Herman M.; Swanson, Kenneth B.; and Jensen, Kenneth D., 3,889,467.

Sweany, Louis P.; and Pirtle, James D., to P. R. Mallory & Co., Inc. High output audible alarm device utilizing a piezoelectric transducer. 3,890,612, Cl. 340-384.00E.

Swearingen, Judson S. Process and apparatus for low temperature refrigeration. 3,889,485, Cl. 62-54.000.

Swinson, Weldon E.: *See—*
Hendrix, Donald E.; Ziegler, Richard E.; and Swinson, Weldon E., 3,890,062.

Swiss Corporation Limited: *See—*
Gartmann, Hans, 3,889,985.

Sylvester, Gordon C., to Wehr Corporation. Flow measuring and monitoring apparatus. 3,889,536, Cl. 73-212.000.

Systron-Donner Corporation: *See—*
Barleen, David G.; and Peters, Rex B., 3,890,513.

Szewalski, Robert, to Polska Akademia Nauk Instytut Maszyn Przeplywowych. Method of improving the power cycle efficiency of a steam turbine for supercritical steam conditions. 3,889,470, Cl. 60-647.000.

Szpitalak, Wesley J., to Continental Can Company, Inc. High speed can printing machine. 3,889,630, Cl. 118-46.000.

T. D. E. Inc.: *See—*
Sanford, Harry W., 3,889,574.

Tabert, Paul, to Elektro-Thermit GmbH. Device for profiling the rail head of vignoles rails. 3,889,575, Cl. 90-12.00A.

Tachimoto, Kazuo: *See—*
Suzuki, Takashi; and Tachimoto, Kazuo, 3,890,139.

Tagami, Hiroshi: *See—*
Hasegawa, Masaki; Nakanishi, Fusae; Nakanishi, Hachiro; Watanabe, Shoji; Suzuki, Yasuzo; Nakane, Hisashi; Aoyama, Toshimi; Komatsubara, Yukio; Nojima, Setsuo; and Tagami, Hiroshi, 3,890,150.

Takagi, Kazumi; and Matsuda, Teruo, to Sumitomo Chemical Co., Ltd. Method for producing isoprene. 3,890,404, Cl. 260-681.000.

Takahashi, Katsuyuki: *See—*
Oishi, Ryota; Mito, Yotaka; Yamauchi, Kenji; Takahashi, Katsuyuki; and Hirata, Kazushi, 3,890,433.

Takahashi, Kentaro: *See—*
Sasame, Takao; Takahashi, Kentaro; Nakamura, Yoshikatsu; and Miura, Kazumasa, 3,890,070.

Takahashi, Koichi; and Hitomi, Nobuteru, to Nissan Motor Company Limited. Method of grinding gears. 3,890,118, Cl. 51-287.000.

Takahashi, Toru: *See—*
Kiyoura, Tadamitsu; Takahashi, Toru; and Kogure, Yasuo, 3,890,381.

Takamatsu, Ikuo, to Yoshida Kogyo Kabushiki Kaisha. Apparatus for applying sliders to a slide fastener chain. 3,889,341, Cl. 29-207.5SL.

Takase, Mituo, to Hitachi, Ltd. Hydraulic turbine operating method and apparatus. 3,890,059, Cl. 415-1.000.

Takata, Isao: *See—*
Matsunaga, Hiroomi; Okumura, Takuzo; Takata, Isao; and Saito, Teruo, 3,890,406.

Takata, Masahiro: *See—*
Ohara, Takashi; Ninomiya, Michikazu; Yanagisawa, Isao; Ueshima, Michio; and Takata, Masahiro, 3,890,248.

Takeba, Kanji: *See—*
Oguri, Eizo; Ogawa, Hiroshi; Date, Koki; and Takeba, Kanji, 3,889,388.

Takeda Chemical Industries, Ltd.: *See—*
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Ochiai, Michihiko; Aki, Osami; Morimoto, Akira; Okada, Taiiti; and Masuda, Katsutada, 3,890,309.
Oguri, Eizo; Ogawa, Hiroshi; Date, Koki; and Takeba, Kanji, 3,889,388.

Takeda, Shinichi: *See—*
Fujii, Takao; Harada, Tomio; Namie, Koshi; and Takeda, Shinichi, 3,890,374.

Takeda, Toshio: *See—*
Tomisawa, Norio; Uchiyama, Yasuji; Okumura, Takatoshi; and Takeda, Toshio, 3,890,602.

Takeda, Yasutsugu, to Hitachi, Ltd. Complex light spatial modulator. 3,890,035, Cl. 350-150.000.

Takeshita, Yasuhiro; Uoi, Michitake; Hirai, Yoshiyuki; and Uchiyama, Mitsuru, to Idemitsu Kosan Co. Ltd. Reversibly crosslinked polymers. 3,890,253, Cl. 260-2.00A.

Takeshita, Yasuo: *See—*
Kazaoka, Kenichi; Hirose, Kimiharu; Takeshita, Yasuo; Matsumoto, Hisao; and Okamoto, Kazuo, 3,889,971.

Takita, Kiyoshi: *See—*
Kobayashi, Reisuke; Sato, Hironari; Takita, Kiyoshi; and Toyama, Nobuo, 3,890,198.

Tam, William A., to Chicago Bridge & Iron Company. Crude oil offshore storage vessel. 3,889,477, Cl. 61-46.500.

Tanaka, Akira, to Nihon Denshi Kabushiki Kaisha. Thermal emission type electron gun. 3,890,533, Cl. 315-31.00R.

Tanaka, Hiroshi: *See—*
Suzuki, Takeshi; Tanaka, Hiroshi; and Akiyama, Masanori, 3,890,151.

Tanaka, Hisayuki; Wada, Yukio; and Shiba, Seiichro, to Matsushita Electric Works, Ltd. Electric hair dryer with spray. 3,889,693, Cl. 132-9.000.

Tanzilli, James D.; and Korney, Arthur F., to B. F. Goodrich Company, The. Weather resistant polyvinyl chloride compounds and method of making same. 3,890,268, Cl. 260-42.290.

Taplin Business Machines Incorporated: *See—*
Hanchett, Leland J., 3,890,597.

Tarmann, Bruno; and Knorr, Johann, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Continuous casting plant. 3,889,740, Cl. 164-274.000.

Taub, David, to Merck & Co., Inc. Loweralkyl esters of 3β-[tri(lower alkyl)silyloxy]-2α-(3-oxo or hydroxy-1-octenyl)-5-oxo-1β-cyclopentane-heptanoic acid, 5-cyclic ethylene acetal. 3,890,351, Cl. 260-340.900.

Tausch, Gilbert H., to Perry R. Bass, Inc.; and Sid W. Richardson Foundation, part interest to each. Apparatus for installing and removing flow control devices from a mandrel having one or more pockets. 3,889,748, Cl. 166-117.500.

Tawfik, David A., to Bendix Corporation, The. Window trip monitor and comparator circuit. 3,890,575, Cl. 328-146.000.

Taylor, Dennis Joseph: *See—*
Littler, Joseph; Taylor, Dennis Joseph; and Campbell, Kenneth James, 3,889,788.

Taylor, Glenn N., to Colgate-Palmolive Company. Disposable diaper with holes or weils. 3,889,679, Cl. 128-287.000.

Taylor, Keith G.: *See—*
Jones, John W.; Sears, John F.; and Taylor, Keith G., 3,890,603.

TCI, Inc.: *See—*
Anderson, Robert D., 3,889,883.

Teach, Eugene G., to Stauffer Chemical Company. Herbicidal method employing meta-anilide urea compounds. 3,890,133, Cl. 71-99.000.

Teach, Eugene G., to Stauffer Chemical Company. Phenoxy acetals and their utility as herbicides. 3,890,134, Cl. 71-100.000.

Techn-Chemie Kessler & Co. GmbH: *See—*
Linhart, Georg, 3,889,716.

Technion Research and Development Foundation, Ltd.: *See—*
Manor, Gedalyahu, 3,889,760.

Teijin Hercules Chemical Co., Ltd.: *See—*
Fujii, Takao; Harada, Tomio; Namie, Koshi; and Takeda, Shinichi, 3,890,374.

Teijin Limited: *See—*
Shimada, Keizo; Nishikawa, Takeo; Harada, Toshiaki; and Nagahama, Shizuo, 3,890,403.

Telang, Yeshwant P.; and Uy, James C., to Ford Motor Company. Coating for rotary engine rotor housings and method of making. 3,890,069, Cl. 418-178.000.

Telang, Yeshwant P.: *See—*
Rao, Vemulapalli D. N.; and Telang, Yeshwant P., 3,890,067.

Telecommunications Industries, Inc.: *See—*
Jonassen, Gaylord D., 3,890,543.
Telefonaktiebolaget L M Ericsson: *See—*
Nordblad, Sven Sigurd; and Svensson, Karl-Erik, 3,890,566.
Tenneco Chemicals, Inc.: *See—*
Minieri, Pasquale P., 3,890,270.
Sidi, Henri; and Johnson, Hilding R., 3,890,264.
Terashima, Toshikatu, to Nakajima All Kabushiki Kaisha. Typewriter platen releasing mechanism having an elastically deformable gear disc. 3,889,794, Cl. 197-123.000.
Terry, Rupert Douglas, to Johns-Manville Corporation. Method and apparatus for applying a cover to a conduit. 3,890,182, Cl. 156-187.000.
Tessier, Marcel: *See—*
Gauthier, Michel; Tessier, Marcel; Fleruy, Daniel; and Jegousse, Michel, 3,889,403.
Tessman, Hans-Erich: *See—*
Tessmann, Erich; and Tessman, Hans-Erich, 3,890,189.
Tessmann, Erich; and Tessman, Hans-Erich, to Heberlein & Co. AG. Apparatus for welding synthetic yarns. 3,890,189, Cl. 156-433.000.
Texaco Inc.: *See—*
Chen, Ting P., 3,890,315.
Child, Edward T; and Robin, Allen M., 3,890,113.
Dowling, Donald J.; Boyd, John F.; and Fuchs, James A., 3,890,502.
Dowling, Donald J.; and Savage, Kerry D., 3,890,563.
McCoy, Frederic C.; and Schlicht, Raymond C., 3,890,219.
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Rubin, Isaac D.; Love, Richard F.; and Holder, Charles B., 3,890,357.
Texas Instruments Incorporated: *See—*
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Textron Inc.: *See—*
Day, Donald L.; Halstead, Charles H.; and Huck, Neil F., 3,889,437.
Reith, Kurt A., 3,889,323.
TheatreVision, Inc.: *See—*
Vogelman, Joseph H.; Spiegelman, Stanley D.; and Berens, Jack, 3,890,461.
Thebault, Jean-Robert: *See—*
Vitat, Jean-Claude; Thebault, Jean-Robert; and Remond, Jean-Pierre, 3,889,930.
Thomas & Betts Corporation: *See—*
Eppler, Daniel, 3,889,517.
Haitmanek, Louis F., 3,889,845.
Izraeli, Hyman, 3,890,029.
Thomas, Geoffrey N.: *See—*
Danielewicz, John C.; Snarey, Michael; and Thomas, Geoffrey N., 3,890,319.
Thomas, Hans Peter; and Buchner, Heinrich, to Klockner-Humboldt-Deutz AG. Device for thermically treating granular and/or lumpy materials. 3,889,393, Cl. 34-167.000.
Thomas, Hans Robert; and Eril, Wolfgang, to Hueck and Cie. Printing unit for selective indirect intaglio and flexographic printing. 3,889,596, Cl. 101-154.000.
Thomas, Jess W., to United States of America, Energy Research and Development Administration. Noble gas absorption process. 3,890,121, Cl. 55-62.000.
Thomas, Onas Leon, to Southwire Company. Personnel safety platform for forklift. 3,889,833, Cl. 214-620.000.
Thomas, Robert E., to John Graves and Associates Incorporated. Display standard. 3,889,409, Cl. 40-11.00A.
Thomas, Robert E., to John Graves and Associates Incorporated. Display standard. 3,889,410, Cl. 40-11.00A.
Thomas, Walter B., to Koppers Company, Inc. Wheel and bearing assembly. 3,890,020, Cl. 308-16.000.
Thompson, David L.: *See—*
Stevens, Douglas; Forberg, Helge O.; Jennings, Larry D.; Stephens, Frank M., Jr.; Bowen, Francis J.; Thompson, David L.; and Copenhaver, Julian V., Jr., 3,890,425.
Thomson-CSF: *See—*
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Cahen, Olivier, 3,890,610.
Croset, Michel; and Velasco, Gonzalo, 3,889,361.
Poirier, Raymond, 3,890,523.
Shroff, Arvind, 3,890,521.
Thornton, Roy F., to General Electric Company. Method of forming a high surface area metallic cadmium powder and an electrode therefrom. 3,890,159, Cl. 136-24.000.
Three Bond Co. Ltd.: *See—*
Saito, Tsutomu, 3,890,273.
Thuries, Edmond; and Joly, Francois, to Delle-Alsthom. Fast cut-out pneumatic switch. 3,890,479, Cl. 200-148.0BV.
Tichy, Nick: *See—*
Wightman, Lawrance W.; Gebhart, Howard C.; and Tichy, Nick, 3,890,487.
Tiemann, Jerome J., to General Electric Company. Variable capacitance semiconductor devices. 3,890,631, Cl. 357-14.000.
Tiemann, Jerome J.: *See—*
Eichelberger, Charles W.; Engeler, William E.; and Tiemann, Jerome J., 3,890,500.
Tiffany, Thomas O.; Walker, William A.; and Johnson, Wayne F., to United States of America, Energy Research and Development Administration. Collection ring for use in multiple-sample blood fractionation centrifugal rotors. 3,890,101, Cl. 23-259.000.
Tillson, Robert S., to General Electric Company. Rejection type fuse holder. 3,890,032, Cl. 339-258.00F.
Timken Company, The: *See—*
Harbottle, William E., 3,890,015.
Tischinger, Heinrich: *See—*
Katz, Otto; and Tischinger, Heinrich, 3,889,333.
Tischlinger, Edward A., to MPL, Inc. Method of assembling a glass tube and thermoplastic resin, finger grip and nose sleeve syringe body assembly. 3,889,351, Cl. 29-447.000.
Tlustos, Giorgio: *See—*
Giangaspero, Michele; Tlustos, Giorgio; and Corsi, Domenico, 3,890,401.
Tobey, Hubert E.; Hood, John W.; and Irvin, Dee L., to International Telephone and Telegraph Corporation. Channeling conveyor. 3,889,548, Cl. 74-395.000.
Tobin, John H., to Olin Corporation. Bromination with trifluoromethylbromide. 3,890,326, Cl. 260-290.0HL.
Tokyo Ohka Kogyo Co., Ltd.: *See—*
Hasegawa, Masaki; Nakanishi, Fusae; Nakanishi, Hachiro; Watanabe, Shoji; Suzuki, Yasuzo; Nakane, Hisashi; Aoyama, Toshimi; Komatsubara, Yukio; Nojima, Setsuo; and Tagami, Hiroshi, 3,890,150.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Suzuki, Takeshi; Tanaka, Hiroshi; and Akiyama, Masanori, 3,890,151.
Toman, Donald J.; and Coulter, J. Roland, to Tull Aviation Corporation. Method and apparatus for modulation synthesis. 3,890,620, Cl. 343-108.00R.
Tombs, Terence Leslie, to Joseph Lucas (Industries) Limited. Spark ignition plug. 3,890,518, Cl. 313-130.000.
Tomco Plastic Inc.: *See—*
Noneman, Thomas S.; Smith, Thomas R.; and Stokes, John B., 3,890,024.
Tomisawa, Norio; Uchiyama, Yasuji; Okumura, Takatoshi; and Takeda, Toshio, to Nippon Gakki Seizo Kabushiki Kaisha. Waveform producing device. 3,890,602, Cl. 340-173.00R.
Torin Corporation: *See—*
Nechay, Jacek A., 3,890,061.
Torme, Melvin H. Book support rack. 3,889,914, Cl. 248-445.000.
Toscano, Robert Julien Antoine: *See—*
David, Pierre Y.; Charles, Joel M.; and Toscano, Robert Julien Antoine, 3,889,928.
Toshio, Kobori: *See—*
Yoshio, Kuramoto; and Toshio, Kobori, 3,890,625.
Toth, Paul D., Sr. Flashlight device. 3,890,498, Cl. 240-10.660.
Toyama Chemical Co., Ltd.: *See—*
Ishimaru, Toshiyasu; and Kodama, Yutaka, 3,890,314.
Toyama, Nobuo: *See—*
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Toyo Ink Manufacturing Co., Ltd.: *See—*
Sumita, Masujiro; and Mori, Masatoshi, 3,890,285.
Toyo Kogyo Co., Ltd.: *See—*
Shigeta, Toshihiko; Yamada, Toshio; Sasame, Takao; and Uebayashi, Yoshitaka, 3,890,209.
Shimoji, Masaharu; Satow, Haruhiko; and Kawano, Tetsuo, 3,889,643.
Toyo Seikan Kaisha Limited: *See—*
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Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Kazaoka, Kenichi; Hirose, Kimiharu; Takeshita, Yasuo; Matsumoto, Hisao; and Okamoto, Kazuo, 3,889,971.
Trans-World Compacters, Inc.: *See—*
Jackson, Ira J.; O'Connor, Thomas F.; and Buckley, James H., 3,889,589.
Travis, Thomas P.: *See—*
Cunningham, Lonnie C.; and Travis, Thomas P., 3,889,881.
Treynor, Paul E.: *See—*
Stuart, Richard L.; Bhopale, Arvind M.; and Treynor, Paul E., 3,890,581.
Triplex Safety Glass Company Limited: *See—*
Burrows, Kenneth; and Hiscutt, Robert, 3,890,217.
Trott, Rolf, to Gewerkschaft Eisenhutte Westfalia. Means for displacing structures. 3,889,479, Cl. 61-85.000.
Trotz, Samuel I.: *See—*
Weisse, Guenther K.; Hooks, Haywood, Jr.; Hyde, Gene A.; and Trotz, Samuel I., 3,890,434.
Trunnell, Harold K. Pipe coupler. 3,889,982, Cl. 285-5.000.
TRW Inc.: *See—*
Hagen, William B.; and Rudin, Morton, 3,890,598.
Herbenar, Edward J.; and Mazur, Sylvester S., 3,890,052.
Tsuchiya, Kaichi: *See—*
Nagashima, Shinichiro; and Tsuchiya, Kaichi, 3,890,146.
Tsygankov, Jury Viktorovich: *See—*
Bogdanov, Georgy Yakovlevich; Deminsky, Jury Andreevich; Zax, Mikhail Isaakovich; and Tsygankov, Jury Viktorovich, 3,890,557.
Tull Aviation Corporation: *See—*
Toman, Donald J.; and Coulter, J. Roland, 3,890,620.
Turner, Harold Roy, to H. R. Turner (Willenhall) Limited. Vehicle seats. 3,890,001, Cl. 297-341.000.
Tuttle, Herman L. Multiple-lock securing system. 3,889,497, Cl. 70-14.000.
Tyas, Trevor, to Weldstow Limited. Needle looms. 3,889,326, Cl. 28-4.00R.

Tyler, Hugh J., to Robertshaw Controls Company. Method of making electrical resistance element. 3,889,362, Cl. 29-619.000.

Uchida, Teruo: *See—*
Hirai, Tadaaki; Maruyama, Eiichi; Inao, Kiyohisa; Yamamoto, Hideaki; Goto, Naohiro; Isozaki, Yukinao; Shidara, Keiichi; and Uchida, Teruo, 3,890,525.

Uchiyama, Mitsuru: *See—*
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Uchiyama, Yasuji: *See—*
Tomisawa, Norio; Uchiyama, Yasuji; Okumura, Takatoshi; and Takeda, Toshio, 3,890,602.

Uebayashi, Yoshitaka: *See—*
Shigeta, Toshihiko; Yamada, Toshio; Sasame, Takao; and Uebayashi, Yoshitaka, 3,890,209.

Ueshima, Michio: *See—*
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Umazume, Kousuke. Method and apparatus for manufacture of decorative sheets. 3,890,185, Cl. 156-299.000.

Unger, Dieter: *See—*
Rademacher, Friedrich; Quest, Karl; Knabe, Uwe; Unger, Dieter; Jordan, Heinz; Heckmann, Werner; and Plock, Karl, 3,889,725.

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Uno, Naoyuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera controls for blocking light entering through a viewfinder ocular. 3,890,627, Cl. 354-224.000.

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Upadhyaya, Janardan D., to Chevron Research Company. Polymerization of 2-pyrrolidone with alkali metal bicarbonate as catalyst. 3,890,280, Cl. 260-78.00P.

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Uroshevich, Miroslav; Powers, Richard T.; and Sperber, Raymond L., to AFA Corporation, The. Child-resistant pill dispenser. 3,889,847, Cl. 221-265.000.

Usab, Martin A., to Georg Fischer Aktiengesellschaft. Fluid material applicator. 3,889,628, Cl. 118-3.000.

Usami, Hiroshi: *See—*
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Vallance, Christopher, to Imperial Chemical Industries Limited. Porous diaphragms. 3,890,417, Cl. 264-49.000.

Van Benthuysen, John D.; and English, Jack A., to CTS Corporation. Variable resistance control. 3,890,590, Cl. 338-174.000.

Vandenberg, Edwin J., to Hercules Incorporated. Shaped articles of crystalline copolymers of cis-1,4-dihalo-2,3-epoxybutane. 3,890,252, Cl. 260-2.00A.

Van den Broek, Arnoldus Johannes Maria: *See—*
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Vander Horst, John; Hounshell, Robert F.; and Dunn, Myron, to Wilkerson Corporation. Gas drying method and apparatus. 3,889,484, Cl. 62-5.000.

Van Houte, Johannes: *See—*
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Van Huisen, Allen T. Geothermal channel and harbor ice control system. 3,889,473, Cl. 61-1.00R.

van Leuwen, Bruce G.; and Powell, Donald G., to Olin Corporation. Cure catalyzed polyurethane composition. 3,890,255, Cl. 260-2.5AQ.

Van Zelderen, Henderik, to Stanley Works, The. Coilable tape measuring device having a self-regulating speed control mechanism. 3,889,897, Cl. 242-107.300.

Vasudevan, Keelathur N.: *See—*
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Vaughn, Walter L.: *See—*
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Viker, Harris W.; and Kropp, William E., to Minnesota Mining and Manufacturing Company. Can closure. 3,889,844, Cl. 220-359.000.
Villani, Gerard J.; and Fedora, Ronald P., to Norton Company. Method of making combustible metal flashlamp charges. 3,889,347, Cl. 29-417.000.
Visco, John. Football blocking training apparatus. 3,889,948, Cl. 273-55.00A.
Vistron Corporation: *See—*
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Vitat, Jean-Claude; Thebault, Jean-Robert; and Remond, Jean-Pierre, to Rhone-Progil. Apparatus for elimination of surface water from articles. 3,889,930, Cl. 259-4.000.
Vlattas, Isidoros: *See—*
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Vogelman, Joseph H.; Spiegelman, Stanley D.; and Berens, Jack, to TheatreVision, Inc. Ticket operated subscription television receiver. 3,890,461, Cl. 178-5.100.
Vogt, Wilhelm; Fischer, Edgar; and Auer, Eberhard, to Hoechst Aktiengesellschaft. Process for making poly-alpha-oxyacrylic acid and its alkali metal salts. 3,890,288, Cl. 260-80.00P.
Vogt, Wilhelm; Auer, Eberhard; Lenz, Gunter; Merkenich, Karl; and Henning, Klaus, to Hoechst Aktiengesellschaft. Alpha-hydroxyacrylic acid/acrylic acid-copolymers and a process for making them. 3,890,291, Cl. 260-80.30R.
Voirol, Peter: *See—*
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Vollmer Werke Maschinenfabrik GmbH: *See—*
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von der Eltz, Hans-Ulrich; Lappe, Franz; and Reuther, Albert, to Hoechst Aktiengesellschaft. Roller-lock. 3,889,495, Cl. 68-5.00E.
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Voorheis, Temple S.; and Vosper, Ralph R., to Coen Company, Inc. Method for reducing burner exhaust emissions. 3,890,084, Cl. 431-10.000.
Vorgrimler, Ludwig; and Hupp, Gerhard, to Industrie-Werke Karlsruhe Augsburg AG. Firearm construction. 3,889,572, Cl. 89-155.000.
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Wagner, Theodor. Intermediate connector for heddle supporting beam. 3,889,721, Cl. 139-91.000.
Wagstaff, Robert A.; and Pedersen, Poul K., to Sperry Rand Corporation. Apparatus to control both the operation of a cutting reel and the grinding mechanism of a forage harvester. 3,889,887, Cl. 241-101.200.
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Wakisaka, Yoshiharu: *See—*
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Waldman, Myron R.: *See—*
Pendleton, Pyam; and Waldman, Myron R., 3,890,504.
Walker, Edward S., to Corning Glass Works. Method and apparatus for transferring tape from a plurality of rolls. 3,889,891, Cl. 242-55.000.
Walker, Fred M. Carton opener. 3,889,367, Cl. 30-2.000.
Walker, Ronda Lynne: *See—*
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Walker, Stephen Sidney: *See—*
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Walker, William A.: *See—*
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Wallace, Virgil T. Steering linkage testing apparatus. 3,889,527, Cl. 73-118.000.
Waller, Jack Douglas; Limmer, Bobby Lee; and Sandlin, Felix M. Cryosurgical spraying apparatus. 3,889,681, Cl. 128-303.100.
Wallin, Jan Olof Wilhelm, to PX Petrocontrol AB. Float-controlled valve. 3,889,706, Cl. 137-172.000.
Walters, Ratus W. Floor stand support and bracing system. 3,889,910, Cl. 248-122.000.
Wang, Gunnar, to Eastman Kodak Company. Dye laser excited by a diode laser. 3,890,578, Cl. 331-94.50L.
Wanner, Karl; Karl, Hubertus; Hansel, Gernot; Bleicher, Manfred; and Schmid, Wolfgang, to Robert Bosch G.m.b.H. Torque-transmitting safety coupling. 3,889,491, Cl. 64-29.000.
Ward, Andrew H.: *See—*
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Warman, Bloomfield James; and Walker, Stephen Sidney, to GTE International Incorporated. Operator display arrangements. 3,890,473, Cl. 179-27.0DB.
Warmskessel, Terry L., to Mack Truck, Inc. Seat belt arrangement. 3,890,002, Cl. 297-385.000.
Warner-Lambert Company: *See—*
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Warner, Richard T., to United Aircraft Corporation. Differential laser gyro employing reflection polarization anisotropy. 3,890,047, Cl. 356-106.0LR.
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Watanabe, Akinori: *See—*
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Watanabe, Akio: *See—*
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Watanabe, Rokuro; and Yoshikawa, Mitsuhiro, to Hitachi, Ltd. Photoconductive target comprising both solid and porous layers. 3,890,524, Cl. 313-386.000.
Watanabe, Shoji: *See—*
Hasegawa, Masaki; Nakanishi, Fusae; Nakanishi, Hachiro; Watanabe, Shoji; Suzuki, Yasuzo; Nakane, Hisashi; Aoyama, Toshimi; Komatsubara, Yukio; Nojima, Setsuo; and Tagami, Hiroshi, 3,890,150.
Watanabe, Takashi; Watamura, Koichi; Kawatani, Kazuya; and Aoki, Hideo, to Ohkura Electric Company, Limited. Apparatus for inducing eddy current in a semiconductor wafer for measuring the electric conductivity or resistivity thereof. 3,890,564, Cl. 324-40.000.
Watanabe, Tatsuo: *See—*
Hashiguchi, Setsuo; and Watanabe, Tatsuo, 3,889,915.
Waters, Robert W. Internal combustion engine. 3,889,645, Cl. 123-45.00R.
Watkins, Bruce J.: *See—*
Regan, A. Michael; and Watkins, Bruce J., 3,889,747.
Wawretschek, Helmuth, to Servomed Arzneimittel GmbH. Drug composition. 3,890,444, Cl. 424-273.000.
Wazawa, Kiyoshi: *See—*
Hosaka, Akio; Baba, Kosaku; and Wazawa, Kiyoshi, 3,890,594.
Weatherhead Company, The: *See—*
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Wellman, Ellis M.; and Moreiras, Luis, 3,889,879.
Weber, Christain; Puck, Alfred; and Voirol, Peter, to Ciba-Geigy Corporation. Mould for article with circumferential undercut flanges. 3,889,921, Cl. 249-161.000.
Weber, Jon N.: *See—*
White, Eugene W.; Weber, Jon N.; and White, Rodney A., 3,890,107.
Weber, Kurt; and Schlapfer, Hans, to Ciba-Geigy AG. Divinyldiphenyl compounds. 3,890,305, Cl. 260-240.00D.
Webster, John David, to English Clays Lovering Pochin & Company Limited. Joints for protectively lined or coated metal pipe sections. 3,890,483, Cl. 219-92.000.
Webster, Peter R.: *See—*
Avant, Richard H.; and Webster, Peter R., 3,889,835.
Wehr Corporation: *See—*
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Wei, Peter H. L.; and Gochman, Carl, to American Home Products Corporation. 7-(2-[1-(phenylsulfonyl)-2-pyrrolidinylthio]acetamino)cephalosporanic acids. 3,890,311, Cl. 260-243.00C.
Weier, Richard M., to G. D. Searle & Co. 7α-carbam oyl-17-hydroxy-3-oxo-17α-pregn-4-ene-21-carboxylic acid γ-lactone and related compounds. 3,890,304, Cl. 260-239.570.
Weigl, James, to Puritan-Bennett Corporation. Respiration rate control system. 3,889,669, Cl. 128-145.800.
Weigle, Gregory Dyett: *See—*
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Weiland, Rolf-Jurgen, to Siemens Aktiengesellschaft. Adjustable dental chair. 3,889,998, Cl. 297-217.000.
Weintraub, Philip M.: *See—*
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Weirich, Walter; and Rosenberg, Harry, to Gewerkschaft Eisenhutte Westfalia. Mine roof support chocks. 3,889,481, Cl. 61-45.00D.

Weiss, Donald Eric; and Battaerd, Hendrik Adriaan Jacobus, to Commonwealth Scientific and Industrial Research Organisation and Imperial Chemical Industries of Austrailia and New Zealand Limited. Process for controlling surface pollutants. 3,890,224, Cl. 210-30.000.

Weisse, Guenther K.; Hooks, Haywood, Jr.; Hyde, Gene A.; and Trotz, Samuel I., to Olin Corporation. Hair and antiseptic formulations containing adducts of bis-(2-pyridyl-1-oxide) disulfide. 3,890,434, Cl. 424-70.000.

Weissmann, Gerd; and Kuebel, Edgar, to Bayer Leichtmetallwerk-Graf Bluecher von Wahlstatt KG. Metallic sintering powder or alloy. 3,890,105, Cl. 29-182.700.

Welch, Joseph T., to Becton, Dickinson and Company. Plasma separator — cord stop type. 3,890,237, Cl. 210-516.000.

Welch, Verlon; and Hinton, Dreama B. Legislative board game apparatus. 3,889,955, Cl. 273-134.00D.

Weldstow Limited: *See—*
Tyas, Trevor, 3,889,326.

Wellman, Ellis M.; and Moreiras, Luis, to Weatherhead Company, The. Internal combustion engine liquid cooling system. 3,889,879, Cl. 237-12.30B.

Welsh, James W., to Hughes Aircraft Company. Structural panel bent from laminated honeycomb. 3,890,108, Cl. 29-191.400.

Wendt, Michael E., to General Electric Company. Plastic orifice inlet extension means. 3,889,988, Cl. 285-239.000.

Wennerstrom, Carl G. Extensible crane. 3,889,818, Cl. 212-55.000.

Werner, Lincoln Harvey, to Ciba-Geigy Corporation. Aminoalkyl-spirocycloalkanes. 3,890,330, Cl. 260-295.50S.

West Electric Company, Ltd.: *See—*
Iwata, Hiroshi, 3,890,536.
Iwata, Hiroshi; Sawada, Yasunori; and Yamaoka, Tetsuo, 3,890,538.

West, Emery L.: *See—*
Roller, William G.; and West, Emery L., 3,889,625.

West, Lynn Parker: *See—*
Haas, Lee C.; and West, Lynn Parker, 3,890,460.

West, Thomas G., to General Electric Company. Regulated power supply utilizing a halfwave switch. 3,890,562, Cl. 323-14.000.

Westermann, William S. Apparatus for trimming and removing the flashing from phonograph records. 3,889,563, Cl. 83-124.000.

Western Electric Company, Incorporated: *See—*
Shaffer, John Richard, 3,889,506.

Western Titanium N.L.: *See—*
Hockin, Harry William, 3,890,138.

Westford, Grimes. Trailer hitch connection protector. 3,889,981, Cl. 280-507.000.

Westinghouse Air Brake Company: *See—*
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Grundy, Reed H., 3,890,577.

Westinghouse Brake & Signal Co. Ltd.: *See—*
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Westinghouse Electric Corporation: *See—*
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Smith, Robert E.; and Carter, Leroy C., 3,890,021.

Westlund, Charles G.: *See—*
Boehringer, Wilfred E.; Little, Jane; Rothi, Robert D.; and Westlund, Charles G., 3,890,064.

Wharton, Franklin Eugene, to McDonald, William F., a part interest. Can crusher. 3,889,587, Cl. 100-98.00R.

Wheeler, Henry D.: *See—*
Wheeler, Robert P.; Wheeler, Jeffrey P.; and Wheeler, Henry D., 3,889,402.

Wheeler, Jeffrey P.: *See—*
Wheeler, Robert P.; Wheeler, Jeffrey P.; and Wheeler, Henry D., 3,889,402.

Wheeler, Robert P.; Wheeler, Jeffrey P.; and Wheeler, Henry D. Shrub baller with articulated digger support members. 3,889,402, Cl. 37-2.00R.

Whetzel, Grace Eva. Doll with removable wig. 3,889,414, Cl. 46-172.000.

Whirlpool Corporation: *See—*
Davis, Rodney L.; Cronk, Don Ray; and Hansen, Carl C., 3,889,392.

White, David B., to E. S. & A. Robinson (Canada) Ltd. Recloseable flexible bag. 3,889,871, Cl. 229-65.000.

White, Eugene W.; Weber, Jon N.; and White, Rodney A., to Research Corporation. Materials useful for prosthetic devices and the like. 3,890,107, Cl. 29-183.000.

White, Max A. Trailer hitch guide. 3,889,384, Cl. 33-264.000.

White, Robert J., to Chevron Research Company. Catalytic hydrogen manufacture. 3,890,432, Cl. 423-655.000.

White, Rodney A.: *See—*
White, Eugene W.; Weber, Jon N.; and White, Rodney A., 3,890,107.

White, William Paul, to United Kingdom Atomic Energy Authority. Openwork conveyor belting. 3,889,803, Cl. 198-189.000.

Whitin Machine Works, Incorporated: *See—*
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Whitt, Delbert K., to Pete Whitt, Inc. Texture and acoustic spraying equipment. 3,889,850, Cl. 222-135.000.

WIBAU (Westdeutsche Industrie-und Strassenbaumaschinen-Gesellschaft m.b.H.): *See—*
Bender, Horst, 3,889,713.

Widdowson, Neville Bruce; and Cullingford, Christopher Varndell, to Lucas Electrical Company Limited, The. Pulse producing devices. 3,890,516, Cl. 310-111.000.

Widmer, Werner, to Societe Genevoise d'Instruments de Physique. Apparatus for controlling the feeler displacement of an electronic dimensional. 3,889,540, Cl. 73-432.00A.

Wiechert, Rudolf: *See—*
Eder, Ulrich; Haffer, Gregor; Ruppert, Jurgen; Sauer, Gerhard; and Wiechert, Rudolf, 3,890,391.

Wiechowski, Joseph W.; Miller, Delmar S.; and Kostner, Richard C., to Poly-Trusions, Inc. Oil well pumping system having reinforced plastic sucker rod. 3,889,579, Cl. 92-3.000.

Wieland, Peter, to Ciba-Geigy Corporation. Process for the introduction of fluorine into the 21-position of 20-oxo-steroids. 3,890,303, Cl. 260-239.55D.

Wiese, Winfred J., to Borg-Warner Corporation. Cooling seal. 3,889,960, Cl. 277-81.000.

Wightman, Lawrance W.; Gebhart, Howard C.; and Tichy, Nick, to Emerson Electric Co. Open coil heater having spaced end coils. 3,890,487, Cl. 219-532.000.

Wiklund, Olof Bruno, to Sunds Aktiebolag. Binding machine. 3,889,584, Cl. 100-26.000.

Wilchester, Harry L.: *See—*
Dycus, Dale W.; Malmberg, Earl W.; and Wilchester, Harry L., 3,890,239.

Wilcox, Gale F.: *See—*
Mohr, Robert G.; Hodges, Ronald R.; Hockenberry, Jack; Scheerhorn, Douglas; and Wilcox, Gale F., 3,890,023.

Wildt Mellor Bromley Limited: *See—*
Farmer, Ernest Leonard; and Ecob, Osmond Herbert, 3,889,493.

Wilfert, Karl; and Barenyi, Bela, to Daimler-Benz Aktiengesellschaft. Motor vehicle, especially passenger motor vehicle. 3,889,968, Cl. 280-111.000.

Wilger, John F.; Uyetake, Tadao S.; and Lai, Clifford Y. C., to United States of America, Navy. Pipe closure apparatus. 3,889,714, Cl. 138-89.000.

Wilkerson Corporation: *See—*
Vander Horst, John; Hounshell, Robert F.; and Dunn, Myron, 3,889,484.

Wilkins, John B. Plastic containers. 3,889,732, Cl. 150-48.000.

Wilkinson Sword Limited: *See—*
Jones, Frederick O., 3,890,109.

Williams, Cecil E. Compact rotary-housing incinerator and steam generator. 3,889,610, Cl. 110-10.000.

Williams, Malcolm; Brunt, Geoffrey Albert Kenyon; and Jones, Christopher Robin, to C.A.V. Limited. Fuel systems for engines. 3,889,648, Cl. 123-139.00E.

Williamson, George. Automatic bale stooker. 3,889,823, Cl. 214-6.00B.

Willis, Frank Marsden: *See—*
Simmons, Walter John; and Willis, Frank Marsden, 3,889,446.

Willis, Frederick Gordon, to Mars, Inc. Energy absorbing device for coin handling mechanisms and the like. 3,889,792, Cl. 194-1.00K.

Wilson, Donald James: *See—*
Kenyon, Derek; and Wilson, Donald James, 3,889,457.

Wilson, Michael C., to Pretty Products, Inc. Dish drainer having integrally hinged sidewalls. 3,889,837, Cl. 220-7.000.

Wiltron Company: *See—*
Bauer, Paul R.; and Dunwoodie, Duane E., 3,890,495.

Wingardh, Uno, to Sprinter Pack AB. Method of forming a container with lid for liquids, especially carbonized beverages. 3,889,443, Cl. 53-14.000.

Winsor, Ronald D.: *See—*
Loeffler, Robert L.; and Winsor, Ronald D., 3,889,452.

Witkoski, Edward J.: *See—*
Insolio, Thomas A.; Kozyrski, Vincent T.; and Witkoski, Edward J., 3,889,862.

Witzig, Armin: *See—*
Frank, Rudolf; Witzig, Karl Emil; and Witzig, Armin, 3,889,555.

Witzig, Karl Emil: *See—*
Frank, Rudolf; Witzig, Karl Emil; and Witzig, Armin, 3,889,555.

Wohrer, Luis C.: *See—*
Economy, James; Frechette, Francis J.; Lin, Ruey Y.; and Wohrer, Luis C., 3,890,262.

Wojtowicz, John A.; and Bhutani, Sudhir K., to Olin Corporation. Ethanolysis of 3-trichloromethyl-5-chloro-1,2,4-thiadizole employing aqueous base. 3,890,338, Cl. 260-302.00D.

Woldring, Sabbo, to General Electric Company. Open circuit system for respiration testing. 3,889,672, Cl. 128-208.000.

Wolf-Gerate GmbH: *See—*
Achenbach, Dieter; and Siegfried, Joswig, 3,889,373.

Wolf, Hans: *See—*
Jeger, Oskar; Wolf, Hans; and Zink, Markus, 3,890,395.

Wolf, Rainer: *See—*
Mayerhoefer, Horst; Mueller, Wolfgang; Soliberger, Urs; and Wolf, Rainer, 3,890,409.

Wolfe, Homer O., Jr.: *See—*
Davis, Frank H.; Wolfe, Homer O., Jr.; and Clapp, Billy D., 3,889,444.

Wolfe, James Richard, Jr., to du Pont de Nemours, E. I., and Company. Thermoplastic copolyester elastomer. 3,890,279, Cl. 260-75.00R.

Wollersheim, Philip. Material compacting device. 3,889,588, Cl. 100-177.000.

Wolt, John, to International Flavors & Fragrances Inc. Novel process for producing 2-acyl-3-alkyl pyrazines. 3,890,320, Cl. 260-250.00B.

Wood, David, to Masson Scott Thrissell Engineering Limited. Apparatus for ejecting stacks of articles from containers. 3,889,824, Cl. 214-6.00H.

Wood, Hamish Christopher Swan; Stuart, Alexander; Curran, Adrian Charles Ward; and Al-hassan, Saieba, to Burroughs Wellcome Co. 3-Amino-3-methyl-2-hydroxy-iminobutan-1-ol and salts thereof. 3,890,387, Cl. 260-566.00A.

Wood, Louis Leonard; and Frisch, Kurt Charles, to W. R. Grace & Co. Method for preparing horticultural foam structures. 3,889,417, Cl. 47-58.000.

Worobey, Walter: *See—*
Pfahnl, Arnold; and Worobey, Walter, 3,890,177.

Worthington-CEI, Incorporated: *See—*
Spafford, Arthur R., 3,890,063.

Wright, Derek Cecil: *See—*
Stent, Vernon Dennis; and Wright, Derek Cecil, 3,890,181.

Wright, Donald Curtis: *See—*
Melling, Richard; Wright, Donald Curtis; and Pickup, John, 3,890,128.

Wright Manufacturing Company: *See—*
Smith, Richard C., 3,889,300.

Wright, Thomas C., to Vistron Corporation. Merchandise display stand. 3,889,813, Cl. 211-13.000.

Wuest, Hans: *See—*
Buchi, George H.; and Wuest, Hans, 3,890,370.

Wunsch, Heinz, to Carl Still, Firma. Apparatus for facilitating the withdrawal of gases from a gas filled chamber such as a coke oven. 3,890,206, Cl. 202-254.000.

Wurm, Jaroslav: *See—*
Rush, William F.; Wurm, Jaroslav; and Dufour, Raymond J., 3,889,742.

Xerox Corporation: *See—*
Krayer, Harry J., III, 3,889,943.
Monahan, Alan R., 3,890,147.
North, Arthur J.; and Stover, Raymond W., 3,889,637.
Schmidlin, Fred W., 3,890,040.

Xonics, Inc.: *See—*
Balser, Martin, 3,889,533.

Yabu, Toshiomi, to Matsushita Electric Industrial Co., Ltd. Step driven magnetic recording and reproducing apparatus. 3,890,640, Cl. 360-50.000.

Yamada, Toshio: *See—*
Shigeta, Toshihiko; Yamada, Toshio; Sasame, Takao; and Uebayashi, Yoshitaka, 3,890,209.

Yamakoshi, Noboru; Minami, Toshihiro; and Somekawa, Sinitiro, to Kobe Steel, Ltd. Hot forging process. 3,889,510, Cl. 72-364.000.

Yamamoto, Hideaki: *See—*
Hirai, Tadaaki; Maruyama, Eiichi; Inao, Kiyohisa; Yamamoto, Hideaki; Goto, Naohiro; Isozaki, Yukinao; Shidara, Keiichi; and Uchida, Teruo, 3,890,525.

Yamamoto, Hisao; Inaba, Shigeho; Sasajima, Kikuo; Nakao, Masaru; Maruyama, Isamu; Ono, Keiichi; and Katayama, Shigenari, to Sumitomo Chemical Co., Ltd. Phenylketone derivatives. 3,890,323, Cl. 260-268.00R.

Yamamoto, Isamu, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor element envelope. 3,890,637, Cl. 357-74.000.

Yamanouchi, Kenzo: *See—*
Ikegami, Yoshizo; and Yamanouchi, Kenzo, 3,890,463.

Yamaoka, Tetsuo: *See—*
Iwata, Hiroshi; Sawada, Yasunori; and Yamaoka, Tetsuo, 3,890,538.

Yamauchi, Kenji: *See—*
Oishi, Ryota; Mito, Yotaka; Yamauchi, Kenji; Takahashi, Katsuyuki; and Hirata, Kazushi, 3,890,433.

Yanagisawa, Isao: *See—*
Ohara, Takashi; Ninomiya, Michikazu; Yanagisawa, Isao; Ueshima, Michio; and Takata, Masahiro, 3,890,248.

Yankee, Herbert L.; and Hlavaty, Robert J., to Colt Industries Operating Corp. Hardening coating for thread rolling dies. 3,889,516, Cl. 72-469.000.

Yardley, John P.: *See—*
Foell, Theodore J.; and Yardley, John P., 3,890,437.

Yasukawa, Hideaki; and Naito, Okito, to Kabushiki Kaisha Suwa Seikosha. Method and apparatus for correcting time in an electronic wristwatch. 3,889,460, Cl. 58-23.00R.

Yoakam, Raymond J.: *See—*
Jones, Chester L. M.; Yoakam, Raymond J.; Hazar, Mitchell M.; and Dillon, Alfred J., 3,889,904.

York, Lyle E.: *See—*
Blomstrom, Gary D.; Piepho, Donald A.; Randour, Victor; and York, Lyle E., 3,889,769.

Yoshida Kogyo Kabushiki Kaisha: *See—*
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Yoshihara, Takahisa: *See—*
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Yoshikawa, Mitsuhiro: *See—*
Watanabe, Rokuro; and Yoshikawa, Mitsuhiro, 3,890,524.

Yoshimura, Syoichiro, to Nippon Electric Company, Limited. Flat-article sorting apparatus for an automatic mail handling system and the like. 3,889,811, Cl. 209-74.00M.

Yoshio, Kuramoto; and Toshio, Kobori, to Minolta Camera Kabushiki Kaisha. Long-time exposure apparatus for camera. 3,890,625, Cl. 354-51.000.

Yoshitake, Norito; Usami, Hiroshi; Kobari, Katsuo; Ishida, Hiroshi; and Fujioka, Yoshiki, to Fujitsu Limited and Fujitsu Fanuc Limited. System for driving a pulse motor. 3,890,554, Cl. 318-696.000.

Young, Dean Arthur, to Union Oil Company of California. Hydrocracking catalyst. 3,890,247, Cl. 252-455.00Z.

Young, Richard H. Stud removing tool. 3,889,557, Cl. 81-53.200.

Youngelson, Harold: *See—*
Sinclair, Brett Jason; and Youngelson, Harold, 3,889,554.

Yukuta, Toshio; Ohashi, Takashi; and Oguri, Yoshiko, to Bridgestone Tire Company Limited. Method of producing aldehyde functional multi-component copolymers. 3,890,293, Cl. 260-80.780.

Yukuta, Toshio: *See—*
Ohnishi, Akira; Yukuta, Toshio; Fujio, Ryota; Ishida, Yozo; Kambara, Shu; and Kojima, Minoru, 3,890,284.

Zacharias, Ellis M., Jr., to Nusonics, Inc. Electroacoustic transducer assembly. 3,890,423, Cl. 310-8.300.

Zahradka, Pavel; Petranek, Milan; and Hrabanek, Jiri, to Elitex, Zavody textilniho strojirenstvi, generalni reditelstvi. Method of securing courses on double cylinder knitting machines. 3,889,492, Cl. 66-14.000.

Zatkin, Allen M. Crown removing device. 3,889,376, Cl. 32-41.000.

Zax, Mikhail Isaakovich: *See—*
Bogdanov, Georgy Yakovlevich; Deminsky, Jury Andreevich; Zax, Mikhail Isaakovich; and Tsygankov, Jury Viktorovich, 3,890,557.

Zegel, Snyder M. Teaching aid for accounting. 3,889,395, Cl. 35-24.00R.

Zehring, Robert B.; Kinninger, Richard W.; and Miller, Allan W., to General Motors Corporation. Hydraulic shock absorber unit. 3,889,787, Cl. 188-317.000.

Zeitlin, Wolf. Wheeled accessories for suitcases. 3,889,965, Cl. 280-47.13R.

Zeitlin, Wolf. Wheeled accessory for suit cases. 3,889,966, Cl. 280-47.13R.

Zellweger AG: *See—*
Ploeckl, Johann, 3,890,034.

Zellweger, Ltd.: *See—*
Felix, Ernst, 3,890,489.

Zenith Radio Corporation: *See—*
Hill, Monty; and Uthene, Curtis, 3,890,464.
Palac, Kazimir, 3,890,526.

Ziegler, Richard E.: *See—*
Hendrix, Donald E.; Ziegler, Richard E.; and Swinson, Weldon E., 3,890,062.

Ziegler, Robert J.: *See—*
Lieberman, Hillel; and Ziegler, Robert J., 3,890,295.

Zimin, Vladimir Anatolievich: *See—*
Fain, Pavel Ioelievich; Zimin, Vladimir Anatolievich; Strashun, Aron Zakharovich; Isupova, Tamara Ivanovna; Pankratov, Alexandr Ivanovich; and Romanov, Georgy Ivanovich, 3,890,457.

Zimmerman, Jessie G.: *See—*
Snider, Robert T.; and Zimmerman, Jessie G., 3,889,413.

Zimmermann, Gunter J. Vertical deflection circuit for television receivers. 3,890,542, Cl. 315-389.000.

Zingarelli, Dino, to Martin Wells Pty. Ltd. Spectacle frames with removable tinted lenses. 3,890,037, Cl. 351-47.000.

Zink, Markus: *See—*
Jeger, Oskar; Wolf, Hans; and Zink, Markus, 3,890,395.

Zirngiebl, Eberhard, to Bayer Aktiengesellschaft. Process for recovering energy from the decomposition of amalgam in the electrolysis of alkali metal chlorides. 3,890,211, Cl. 204-99.000.

Ziv, Avraham, to American Safety Equipment Corporation. Piggyback dual lock bar. 3,889,898, Cl. 242-107.400.

Zoecon Corporation: *See—*
Henrick, Clive A.; and Siddall, John B., 3,890,398.

Zuercher, Warren H., to Kimwood Corporation. Residue removal system for belt abrader. 3,889,429, Cl. 51-135.00R.

Zust, Armin; Schindler, Walter, deceased; and by Gysin, Leonhard, executor, to CIBA-GEIGY Corporation. Imidazolidinone derivatives in the treatment of emesis and psychosomatic disturbances. 3,890,439, Cl. 424-250.000.

Zweekly, Raymond Tibor, to Valeron Corporation, The. Lateral lock indexable insert cutting tool. 3,889,330, Cl. 29-96.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF JUNE, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aereon Corp. : *See*—
Fitzpatrick, John R., and Bock. Re. 28,454.
Bock, Juergen K. : *See*—
Fitzpatrick, John R., and Bock. Re. 28,454.
Fitzpatrick, John R., and J. K. Bock, to Aereon Corp. Airship. Re. 28,454, 6–17–75, Cl. 244—25.
Plaste Co., Inc. : *See*—
Sandow, Kiyoshi. Re. 28,453.
Sandow, Kiyoshi, to Plaste Co., Inc. Heat and Smoke Vent. Re. 28,453, 6–17–75, Cl. 52—232.

LIST OF PLANT PATENTEES

Dearing, Ellis H., ½ interest to Otto D. Terrell. Four leaf clover plant. 3,730, 6–17?75, Cl. 88.
Fischer, Carl H., to Selected Glads, Inc. Gladiolus. 3,732, 6–17–75, Cl. 85.
Selected Glads, Inc. : *See*—
Vincent, Harold and H. J. 3,731.
Fischer, Carl H. 3,732.
Terrell, Otto D. : *See*—
Dearing, Ellis H. 3,730.
Vincent, Harold and H. J., to Selected Glads, Inc. Gladiolus. 3,731, 6–17–15, Cl. 85.
Vincent, Herbert J. : *See*—
Vincent, Harold and H. J. 3,731.

LIST OF DESIGN PATENTEES

Armbruster, John T., to American Optical Corp. Microscope stand. 235,478, 6–17–75, Cl. D57—1.
Amerace Corp. : *See*—
May, Joseph R., and Morgan. 235,432.
May, Joseph R., and Morgan. 235,433.
American Optical Corp. : *See*—
Armbruster, John T. 235,478.
Amerock Corp. : *See*—
Tegner, Raymond U. H., and Johnson. 235,397.
Tegner, Raymond U. H. 235,398.
Tegner, Raymond U. H., and Johnson. 235,401.
Amstutz, Harlan C. Femoral hip prosthesis. 235,485, 6–17–75, Cl. D83—1.
Ashflash, Corp., The : *See*—
Squardra, John H. 235,471.
Baro, Carmen : *See*—
Baro, Mario and Carmen. 235,484.
Baro, Mario and Carmen. Inhalator. 235,484, 6–17–75, Cl. D83—1.
Baughman, Karl T., to Sears, Roebuck and Co. Portable typewriter. 235,480, 6–17–75, Cl. D64—11.
Binder, Joseph, and C. Palestini, to The Bohack Corp. Store building facade. 235,437, 6–17–75, Cl. D13—1.
Blumenfeld, Michael J., to Comar Athletic Enterprises, Inc. Athletic shoe. 235,392, 6–17–75, Cl. D2—311.
Bobrick, Mitchell, M. Evenson, M. M. Buzan, and M. L. Quin ; said Quin and Buzan assignors to Emerson Electric Co. Combined reading and examination light and support therefor. 235,470, 6–17–75, Cl. D48—20.
Bohack Corp., The : *See*—
Binder, Joseph, and Palestini. 235,437.
Boucher, Richard A. : *See*—
Swett, James B., and Boucher. 235,402.
Swett, James B., and Boucher. 235,404.
Brody, Ernest O., to Lancaster Colony Corp. Basket for flowers or the like. 235,420, 6–17–75, Cl. D9—247.
Brown, Dwight C. Hinged skirt and trouser hanger. 235,403, 6–17–75, Cl. D6—252.
Brown, Eugene. Standard and bracket combination. 235,400, 6–17–75, Cl. D6—114.
Brown, Gordon M., to General Motors Corp. Door for an automobile. 235,429, 6–17–75, Cl. D12—196.
Brown, Lester, F. J. Burg, R. Dzielonski, and M. Lax, to Salton, Inc. Temperature measuring spoon. 235,405, 6–17–75, Cl. D7—50.
Brunswick Corp. : *See*—
Miller, Karl E. 235,442.
Burg, Ferderick J. : *See*—
Brown, Lester, Burg, Dzielonski, and Lax. 235,405.
Buzan, Morris M. : *See*—
Bobrick, Mitchell, Evenson, Buzan, and Quin. 235,470.
Campbell, Laurie J. : *See*—
Terzian, Rouben T., Dunn, and Campbell. 235,459.
Carl Mfg. Co., Ltd. : *See*—
Mori, Chuzo. 235,425.
Caron International Inc. : *See*—
Somen, Alta M. 235,391.
Chapman, David. Vaporizer humidifier. 235,450, 6–17–75, Cl. D23—148.
Comar Athletic Enterprises, Inc. : *See*—
Blumenfeld, Michael J. 235,392.
Daenen, Robert, to Dart Industries, Inc. Combined food storage and serving dish. 235,406, 6–17–75, Cl. D7—76.
Dart Industries, Inc. : *See*—
Daenen, Robert. 235,406.
Swett, James B., and Boucher. 235,402.
Swett, James B., and Boucher. 235,404.
Deutsche Texaco Aktiengesellschaft : *See*—
Geisler, Hans P. L. 235,472.
Dominion Auto Accessories Ltd. : *See*—
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Douglas, Patrick J. : *See*—
O'Neill, Patrick, and Douglas. 235,476.
O'Neill, Patrick, and Douglas. 235,477.
Dunn, Kathy : *See*—
Terzian, Rouben T., Dunn, and Campbell. 235,459.
Dzielonski, Robert : *See*—
Brown, Lester, Burg, Dzielonski, and Lax. 235,405.
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Emerson Electric Co. : *See*—
Bobrick, Mitchell, Evenson, and Buzan. 235,470.
Epstein, Dorothy : *See*—
Epstein, Maurice J. 235,410.
Epstein, Maurice J., to Dorothy Epstein. Clamping arrangement for combined squeegee and sponge device. 235,410, 6–17–75, Cl. D7—178.
Evenson, Mel. : *See*—
Bobrick, Mitchell, Evenson, Buzan, and Quin. 235,470.
Faroy, Inc. : *See*—
Frazier, Preston J., Jr. 235,468.
Frazier, Preston J., Jr. 235,469.
Filho, Jose C. Novelty lens for sunglasses. 235,479, 6–17–75, Cl. D57—1.
Fisher, Morris F., to Futorian Corp. Chair. 235,395, 6–17–75, Cl. D6—71.
Fortsch, William A., to Thomas & Betts Corp. Clamp. 235,416, 6–17–75, Cl. D8—229.
Foster, Dean H., and G. R. Tricycle. 235,426, 6–17–75, Cl. D12—112.
Foster, George R. : *See*—
Foster, Dean H. and G. R. 235,426.
France Bed Co., Ltd. : *See*—
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Frazier, Preston J., Jr., to Faroy, Inc. Candleholder. 235,468, 6–17–75, Cl. D48—2.
Frazier, Preston J., Jr., to Faroy, Inc. Candleholder. 235,469, 6–17–75, Cl. D48—2.
Futorian Corp. : *See*—
Fisher, Morris F. 235,395.

Geisler, Hans P. L., to Deutsche Texaco Aktiengesellschaft. Outdoor ground level lighting fixture. 235,472, 6–17–75, Cl. D48—31.

Genaro, Donald M., to The Singer Co. Sewing machine or similar article. 235,482, 6–17–75, Cl. D70—1.

General Motors Corp.: *See*—
Brown, Gordon M. 235,429.

Generalis, Alexander L., and M. C. Roberto. Bicycle hanger. 235,427, 6–17–75, Cl. D12—115.

Goodrich, B. F., Co., The: *See*—
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Gray, Gregg L. Book cover. 235,438, 6–17–75, Cl. D19—26.

Gray, Gregg L. Book cover. 235,439, 6–17–75, Cl. D19—26.

Guilion, Elmer H. Caddy for plumbers and electricians. 235,423, 6–17–75, Cl. D12—29.

Gutkowski, Ronald R.: *See*—
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Hart, Donald G. Car top luggage carrier. 235,428, 6–17–75, Cl. D12—157.

Heffner, Frederick D. Combined tennis ball retriver and storage container. 235,463, 6–17–75, Cl. D34—5.

Hemmelsbach, Richard J., to Space Age Industries, Inc. Building. 235,434, 6–17–75, Cl. D13—1.

Holcomb, Jack N. Miniature radio receiver. 235,449, 6–17–75, Cl. D26—14.

House of Health, Inc.: *See*—
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Ikeda, Matafumi, to Sharp Kabushiki Kaisha (Sharp Corp.) Electronic calculating machine. 235,452, 6–17–75. Cl. D26—5.

Inland-Ryerson Construction Products Co.: *See*—
Rave, John N., and Jobst. 235,481.

Imperial Metal Industries (Kynoch) Ltd.: *See*—
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Ishikawa, Minoru, to Omron Tateisi Electronics Co. Calculating machine. 235,451, 6–17–75, Cl. D26—5.

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Rave, John N., and Jobst. 235,481.

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Mackay, Frederick G., Lee, and Johnson. 235,445.

Johnson, Dwight N., and T. E. Kwast, to The Singer Co. Pressure regulator or similar article. 235,443, 6–17–75, Cl. D23—21.

Johnson, Dwight N., and T. E. Kwast, to The Singer Co. Pressure regulator or similar article. 235,444, 6–17–75, Cl. D23—21.

Johnson, Robert W.: *See*—
Tegner, Raymond U. H., and Johnson. 235,397.
Tegner, Raymond U. H., and Johnson. 235,401.

Johnson, S. C., & Son, Inc.: *See*—
Petterson, Tor, and Gutkowski. 235,418.

Kachavos, Louis J., to Plastic Techniques, Inc. Bucket step for an aerial lift bucket and liner. 235,474, 6–17–75, Cl. D54—1.

Korol, Stanley F. Bathtub. 235,446, 6–17–75, Cl. D23—55.

Kwast, Theodore E.: *See*—
Johnson, Dwight N., and Kwast. 235,443.
Johnson, Dwight N., and Kwast. 235,444.

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Lancaster Colony Corp.: *See*—
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Lanier Electronic Laboratory, Inc.: *See*—
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Lax, Michael: *See*—
Brown, Lester, Burg, Dzielonski, and Lax. 235,405.

Lee, Gerald W.: *See*—
Mackay, Frederick G., Lee, and Johnson. 235,445.

Leight, Charles. Ear plug. 235,483, 6–17–75, Cl. D83—1.

Lever, Paul H. Freestanding fireplace. 235,447, 6–17–75, Cl. D23—97.

Liberty Foundry Co.: *See*—
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Lindow, Albert A., Jr. Battery carrier. 235,454, 6–17–75, Cl. D26—6.

Loomis, Roland E., to House of Health, Inc. Display stand. 235,393, 6–17–75, Cl. D6—24.

Lovelace, Bill N., and F. A. Pritchard. Inflatable cushion pad for golf bag shoulder strap or the like. 235,460, 6–17–75, Cl. D34—5.

Mackay, Frederick G., G. W. Lee, and A. B. Johnson, to Teledyne Industries, Inc. Shower head. 235,445, 6–17–75, Cl. D23—35.

Malnekoff, Joyce. Container for rooting plant cuttings. 235,399, 6–17–75, Cl. D6—113.

Martin, Albert W. Magnetic tape transport. 235,453, 6–17–75, Cl. D26—5.

Martini, Leo J., to Master Fence Fittings, Inc. Combination gate hinge and corner. 235,415, 6–17–75, Cl. D8—191.

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May, Joseph R., and D. F. Morgan, to Amerace Corp. Wheel center. 235,433, 6–17–75, Cl. D12—211.

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May, Joseph R., and Morgan. 235,433.

Miller, Robert C., to Nancy Eastman. Carpet knife. 235,414, 6–17–75, Cl. D8—98.

Mims, Martin J. Suction cleaner or the like. 235,409, 6–17–75, Cl. D7—168.

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Pennington, Albert W. Football kicking tee. 235,462, 6–17–75, Cl. D34—5.

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CLASSIFICATION OF PATENTS

ISSUED JUNE 17, 1975

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CLASS 5
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CLASS 6
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1VC 3,890,467
1VL 3,890,465
6.5 3,890,468
15AL 3,890,471
15AT 3,890,469
15AW 3,890,472
15BF 3,890,470
27DB 3,890,473
107E 3,890,474
156A 3,890,475

CLASS 180
9.5 3,889,769
14R 3,889,770
44R 3,889,771
64A 3,889,772
65R 3,889,773
104 3,889,774
118 3,889,775

CLASS 181
50 3,889,776

CLASS 182
6 3,889,777
17 3,889,778
223 3,889,779

CLASS 184
1R 3,889,780
15R 3,889,781

CLASS 187
9 3,889,782

CLASS 188
52 3,889,783
71.4 3,889,784
73.3 3,889,785
218R 3,889,786
317 3,889,787

CLASS 191
40 3,889,788

CLASS 192
82T 3,889,789
85AT 3,889,790

CLASS 193
3 3,889,791

CLASS 194
1K 3,889,792

CLASS 195
66R 3,890,198
80R 3,890,199
103.5R 3,890,200
127 3,890,201
3,890,202
139 3,890,203
3,890,204

CLASS 197
1R 3,889,793
123 3,889,794
151 3,889,795

CLASS 198
7 3,889,796
35 3,889,797
127 3,889,798
168 3,889,799
179 3,889,800
184 3,889,801
3,889,802
189 3,889,803

CLASS 200
61.62 3,890,476
83P 3,890,477
84R 3,890,478
148BV 3,890,479
150R 3,890,258
302 3,890,480

CLASS 202
236 3,890,205
254 3,890,206

CLASS 203
11 3,890,207
58 3,890,208

CLASS 204
16 3,890,209
43N 3,890,210
70 3,890,214
99 3,890,211
129.2 3,890,215
158R 3,890,212
158 3,890,213
177 3,890,216
298 3,890,217

CLASS 206
223 3,889,804
3,889,805
3,889,806
315 3,889,807
364 3,889,808
372 3,889,809

CLASS 208
135 3,890,218
310 3,890,219

CLASS 209
3 3,890,220
74M 3,889,811
76 3,889,810
111.7 3,890,221
166 3,890,222
457 3,890,223

CLASS 210
30 3,890,224
38 3,890,225
44 3,890,226
51 3,890,227
58 3,890,228
73 3,890,229
104 3,890,289
136 3,890,290
169 3,890,230
199 3,890,231
223 3,890,232
237 3,890,233
242 3,890,234
330 3,890,235
433 3,890,236
516 3,890,237

CLASS 211
1.5 3,889,812
13 3,889,813
27 3,889,814
41 3,889,815
43 3,889,816
163 3,889,817

CLASS 212
55 3,889,818
94 3,889,819

CLASS 214
1BB 3,889,820
3,889,821
1.5 3,889,822
6B 3,889,823
6H 3,889,824
6M 3,889,825
17DA 3,889,826
77P 3,889,827
83.3 3,889,828
147G 3,889,829
152 3,889,830
340 3,889,831
514 3,889,832
620 3,889,833

CLASS 215
10 3,889,834

CLASS 219
69M 3,890,481
73 3,890,482
92 3,890,483
432 3,890,484
523 3,890,485
3,890,486
532 3,890,487

CLASS 220
3 3,889,835
5A 3,889,836
7 3,889,837
22.3 3,889,838
72 3,889,839
82A 3,889,840
200 3,889,841
253 3,889,842
332 3,889,843
359 3,889,844

CLASS 221
70 3,889,845
79 3,889,846
265 3,889,847

CLASS 222
58 3,889,848
63 3,889,849
135 3,889,850
146HS 3,889,851
153 3,889,852
177 3,889,853
284 3,889,854
355 3,889,855
402.13 3,889,856

CLASS 223
32 3,889,857
35 3,889,858

CLASS 224
8R 3,889,859
45R 3,889,860
45S 3,889,861

CLASS 225
96.5 3,889,862
99 3,889,863

CLASS 227
109 3,889,865

CLASS 228
173 3,889,349

CLASS 229
22 3,889,866
28R 3,889,867
34R 3,889,868
54R 3,889,869
55 3,889,870
63 3,889,872
65 3,889,871
72 3,889,873

CLASS 232
35 3,889,874

CLASS 235
61A 3,889,875
61.9A 3,890,488
92PD 3,890,489
92TF 3,890,490
101 3,890,491
151.1 3,889,876
151.33 3,890,492
153AE 3,890,493
153AK 3,890,495
153R 3,890,494
159 3,890,496

CLASS 236
15C 3,889,877

CLASS 237
8R 3,889,878
12.3B 3,889,879

CLASS 239
18 3,889,880
70 3,889,881
127.3 3,889,882
679 3,889,883

CLASS 240
7.55 3,890,497
10.66 3,890,498

CLASS 241
24 3,889,884
46.11 3,889,885
100 3,889,886
101.1 3,889,888
101.2 3,889,887
228 3,889,889
245 3,889,890

CLASS 242
55 3,889,891
56R 3,889,892
57.1 3,889,893
74 3,889,894
75.43 3,889,895
86 3,889,896
107.3 3,889,897
107.4 3,889,898
118.32 3,889,899
199 3,889,900
209 3,889,901

CLASS 244
17.23 3,889,902
25 Re.28,454
42CC 3,889,903
104R 3,889,904

CLASS 246
170 3,889,905

CLASS 248
2 3,889,906
24 3,889,907
42 3,889,908
56 3,889,909
122 3,889,910
228 3,889,911
255 3,889,912
430 3,889,913
445 3,889,914
475B 3,889,915

CLASS 249
59 3,889,916
64 3,889,917
85 3,889,918
141 3,889,919
151 3,889,920
161 3,889,921

CLASS 250
201 3,890,499
211J 3,890,500
265 3,890,501
267 3,890,502
321 3,890,503
325 3,890,504
361 3,890,505
366 3,890,355
370 3,890,506
483 3,890,507
548 3,890,508
561 3,890,509
565 3,890,510

CLASS 251
14 3,889,922
170 3,889,923
249.5 3,889,924
327 3,889,925

CLASS 252
1 3,890,238
8.55D 3,890,239
62.1 3,890,240
62.9 3,890,241
107 3,890,242
186 3,890,243
301.1R 3,890,244
432 3,890,246
447 3,890,245
455Z 3,890,247
456 3,890,248
458 3,890,249
516 3,890,250
519 3,890,251

CLASS 254
1 3,889,926
105 3,889,927
172 3,889,928
173B 3,889,929

CLASS 259
4 3,889,930
96 3,889,931
191 3,889,932

CLASS 260
2A 3,890,252
3,890,253
2.5AQ 3,890,255
2.5DB 3,890,254
23H 3,890,259
23.7H 3,890,261
23.7R 3,890,260
28 3,890,262
28.5AS 3,890,263
29.6HN 3,890,264
33.6UB 3,890,265
37PC 3,890,266
42.18 3,890,267
42.29 3,890,268
45.75S 3,890,276
3,890,277
45.8NE 3,890,275
45.8N 3,890,270
46.5E 3,890,269
46.5R 3,890,271
47CP 3,890,274
47UA 3,890,272
3,890,273
47C 3,890,256
63R 3,890,278
75R 3,890,279
77.5C 3,890,281
78L 3,890,286
78P 3,890,280
78.3R 3,890,283
78.4EP 3,890,284
78.5BB 3,890,285
78.5T 3,890,282
79.3A 3,890,287
80P 3,890,288
80.3R 3,890,291
80.76 3,890,292
80.78 3,890,293
94.7N 3,890,294
97.6 3,890,295
148 3,890,257
210F 3,890,296
3,890,298
210R 3,890,297
211.5R 3,890,299
233.3R 3,890,300
234R 3,890,301
239E 3,890,302
239.55D 3,890,303
239.57 3,890,304
240D 3,890,305
240E 3,890,306
3,890,307
243C 3,890,309
3,890,310
3,890,311
3,890,314
243D 3,890,313
247 3,890,315
3,890,316
247.2A 3,890,318
249.5 3,890,317
250B 3,890,320
250Q 3,890,319
251R 3,890,321
268C 3,890,322
268R 3,890,323
287R 3,890,324
3,890,325
290HL 3,890,326
293.52 3,890,329
293.55 3,890,327
293.62 3,890,328
294.8D 3,890,331
294.8G 3,890,332
295.5B 3,890,333
295.5S 3,890,330
297F 3,890,334
297R 3,890,335
302D 3,890,338
3,890,339
302E 3,890,336
302S 3,890,337
304 3,890,340
306.7T 3,890,341
308C 3,890,342
309.2 3,890,343
3,890,344

313.1 3,890,345
325PH 3,890,346
326.1 3,890,347
326.11R 3,890,348
326.46 3,890,349
340.5 3,890,350
340.9 3,890,351
3,890,352
343 3,890,353
343.5 3,890,354
343.6 3,890,361
343.9 3,890,312
397.5 3,890,356
404 3,890,357
410.6 3,890,358
429R 3,890,359
453R 3,890,362
455A 3,890,363
456A 3,890,364
465D 3,890,367
465E 3,890,368
465F 3,890,366
465.8A 3,890,365
468D 3,890,369
3,890,371
3,890,372
468L 3,890,370
473R 3,890,373
475R 3,890,374
3,890,375
485F 3,890,376
500.5H 3,890,377
502.4P 3,890,378
519 3,890,379
520 3,890,380
531C 3,890,381
543P 3,890,382
556AR 3,890,383
563R 3,890,384
566AC 3,890,386
566AE 3,890,385
566A 3,890,387
578 3,890,388
584B 3,890,389
590 3,890,390
3,890,391
596 3,890,392
607R 3,890,393
609R 3,890,394
617F 3,890,395
618F 3,890,396
621H 3,890,397
653.3 3,890,398
654R 3,890,399
666A 3,890,400
667 3,890,401
668F 3,890,402
674N 3,890,403
681 3,890,404
827 3,890,405
874 3,890,406
878R 3,890,407
879 3,890,408
927R 3,890,409
956 3,890,410
969 3,890,411

CLASS 261

90 3,890,412

CLASS 264

40 3,890,413
45.1 3,890,414
45.5 3,890,416
46.7 3,890,415
49 3,890,417
54 3,890,418
171 3,890,419
261 3,890,420
289 3,890,421
290R 3,890,422

CLASS 266

24 3,889,864
34L 3,889,933

CLASS 267

9C 3,889,937
34 3,889,934
65D 3,889,935
65R 3,889,936
153 3,889,938

CLASS 270

21 3,889,939
61F 3,889,940
69 3,889,941

CLASS 271

3 3,889,942
4 3,889,943

CLASS 272

90 3,889,944

CLASS 273

6 3,889,945
33 3,889,946
43A 3,889,947
55A 3,889,948
55R 3,889,949
58D 3,889,950
73F 3,889,951
121R 3,889,952
130B 3,889,953
134C 3,889,954
134D 3,889,955
138A 3,889,956
182R 3,889,957

CLASS 277

24 3,889,958
27 3,889,959
81 3,889,960
166 3,889,961

CLASS 279

46 3,889,962

CLASS 280

36B 3,889,963
43.24 3,889,964
47.13R 3,889,965
3,889,966
47.35 3,889,967
111 3,889,968
150SB 3,889,969
3,889,971
150B 3,889,970
150.5 3,889,972
179A 3,889,973
251 3,889,974
281 3,889,975
400 3,889,976
408 3,889,977
415B 3,889,978
446R 3,889,979
461A 3,889,980
507 3,889,981

CLASS 285

5 3,889,982
13 3,889,983
27 3,889,984
95 3,889,985
137R 3,889,986
155 3,889,987
239 3,889,988
341 3,889,989

CLASS 289

5 3,889,990

CLASS 291

1 3,889,991

CLASS 292

87 3,889,992
251 3,889,993

CLASS 293

85 3,889,994

CLASS 294

16 3,889,995
19A 3,889,996

CLASS 296

62 3,889,997

CLASS 297

217 3,889,998
248 3,889,999
284 3,890,000
341 3,890,001
385 3,890,002
388 3,890,003
423 3,890,004

CLASS 298

22P 3,890,005
23D 3,890,006

CLASS 299

4 3,890,007

CLASS 301

5B 3,890,008
9DN 3,890,009
52 3,890,010

CLASS 302

31 3,890,011

CLASS 303

6R 3,890,012
20 3,890,013
24R 3,890,014

CLASS 307

106 3,890,511
203 3,890,512

CLASS 308

1R 3,890,015
3,890,016
3A 3,890,017
8.2 3,890,018
10 3,890,019
16 3,890,020
126 3,890,021

CLASS 310

8.3 3,890,423
9.1 3,890,513
49 3,890,514
104 3,890,515
111 3,890,516
168 3,890,517

CLASS 312

140 3,890,022
198 3,890,023
330 3,890,024

CLASS 313

55 3,890,521
130 3,890,518
3,890,519
366 3,890,523
386 3,890,524
3,890,525
408 3,890,526
3,890,527
414 3,890,528
460 3,890,529
485 3,890,522
489 3,890,530
490 3,890,531

CLASS 315

3 3,890,532
31R 3,890,533
92 3,890,534
111 3,890,535
151 3,890,536
208 3,890,537
241P 3,890,538
273 3,890,539
335 3,890,540
366 3,890,541
389 3,890,542

CLASS 317

16 3,890,543
27R 3,890,544
51 3,890,545
258 3,890,546

CLASS 318

6 3,890,547
139 3,890,548
246 3,890,549
376 3,890,551
568 3,890,552
678 3,890,550
3,890,553
696 3,890,554

CLASS 320

2 3,890,555
21 3,890,556

CLASS 321

16 3,890,557

CLASS 323

4 3,890,558
14 3,890,562
21 3,890,559
22SC 3,890,560
24 3,890,561

CLASS 324

6 3,890,563
40 3,890,564
43R 3,890,565
54 3,890,566
64 3,890,567
71CP 3,890,568
3,890,569
77R 3,890,570
95 3,890,571

CLASS 325

42 3,890,572
451 3,890,573
470 3,890,574

CLASS 328

146 3,890,575

CLASS 330

18 3,890,576
31 3,890,577

CLASS 331

94.5L 3,890,578
111 3,890,579
116R 3,890,580

CLASS 332

11R 3,890,581

CLASS 333

24.2 3,890,582
95A 3,890,583
98R 3,890,584

CLASS 335

198 3,890,585
208 3,890,586
255 3,890,587

CLASS 338

28 3,890,588
89 3,890,589
174 3,890,590

CLASS 339

14P 3,890,025
21R 3,890,026
64R 3,890,027
85 3,890,028
98 3,890,029
113L 3,890,030
119L 3,890,031
258F 3,890,032

CLASS 340

6R 3,890,591
3,890,598
15 3,890,592
15.5MC 3,890,593
17 3,890,606
52H 3,890,594
58 3,890,595
146.3MA 3,890,596
146.3Z 3,890,597
149R 3,890,599
172.5 3,890,600
3,890,601
173AM 3,890,603
173R 3,890,602
173.2 3,890,604
174TF 3,890,605
199 3,890,607
274 3,890,608
324M 3,890,609
347CC 3,890,610
347DA 3,890,611
384E 3,890,612
407 3,890,613

CLASS 343

5DP 3,890,614
5MM 3,890,616
5PD 3,890,615
7A 3,890,617
17.1R 3,890,618
105R 3,890,619
108R 3,890,620

CLASS 346

74ES 3,890,621
74E 3,890,622
74.1 3,890,623
91 3,890,624

CLASS 350

7 3,890,034
150 3,890,035
184 3,890,036
266 3,890,033

CLASS 351

47 3,890,037

CLASS 354

51 3,890,625
197 3,890,626
224 3,890,627
227 3,890,628
299 3,890,629

CLASS 355

1 3,890,038
3R 3,890,039
16 3,890,040
18 3,890,041
53 3,890,042
62 3,890,043
3,890,044
73 3,890,045

CLASS 356

37 3,890,046
106LR 3,890,047
199 3,890,048
3,890,049
237 3,890,050

CLASS 357

13 3,890,630
14 3,890,631
3,890,635
23 3,890,632
24 3,890,633
40 3,890,634
68 3,890,636
74 3,890,637

CLASS 358

8 3,890,638

CLASS 360

14 3,890,639
50 3,890,640
71 3,890,641
96 3,890,642
99 3,890,643
101 3,890,644
117 3,890,645

CLASS 403

20 3,890,051
27 3,890,052
44 3,890,053

CLASS 404

10 3,890,054
84 3,890,055
117 3,890,056

CLASS 408

43 3,890,057
112 3,890,058

CLASS 415

1 3,890,059
119 3,890,060

CLASS 416

3,890,061
134 3,890,062
234

CLASS 417

27 3,890,063
237 3,890,064
360 3,890,065

CLASS 418

71 3,890,066
121 3,890,067
132 3,890,068
178 3,890,069
3,890,070
260 3,890,071

CLASS 423

19 3,890,424
127 3,890,425
3,890,426
129 3,890,427
264 3,890,428
395 3,890,429
446 3,890,430
575 3,890,431
655 3,890,432

CLASS 424

37 3,890,433
70 3,890,434
115 3,890,435
118 3,890,436
177 3,890,437
240 3,890,438
250 3,890,439
263 3,890,440
267 3,890,441
269 3,890,442
270 3,890,443
273 3,890,444
275 3,890,445
326 3,890,446

CLASS 425

6 3,890,072
48 3,890,073
71 3,890,074
88 3,890,075
110 3,890,076
111 3,890,077
141 3,890,078
155 3,890,079
242R 3,890,308
363 3,890,080
450.1 3,890,081
451.9 3,890,082
462 3,890,083

CLASS 426

105 3,890,447
126 3,890,448
127 3,890,449
132 3,890,450
264 3,890,451
321 3,890,452
503 3,890,453
508 3,890,454

CLASS 427

85 3,890,455

CLASS 428

216 3,890,456

CLASS 431

10 3,890,084
125 3,890,085
168 3,890,086
277 3,890,087
351 3,890,088

CLASS 432

11 3,890,089
250 3,890,090

CLASSIFICATION OF DESIGNS

D2—	24	235,389		76	235,406	D12—	29	235,423			235,441		42	235,457		32R	235,473
		235,390		121	235,407		62	235,424		76	235,425	D34—	5BC	235,464	D54—	1A	235,474
	257	235,391		128	235,408		112	235,426	D22—	27	235,442		CB	235,461		13	235,475
	311	235,392		131	235,402		115	235,427	D23—	21	235,443		GB	235,460	D55—	IC	235,476
D6—	24	235,393		168	235,409		157	235,428			235,444		GH	235,465			235,477
	45	235,394		178	235,410		196	235,429		35	235,445		GT	235,462	D57—	A	235,479
	71	235,395		179	235,411		205	235,430		55	235,446		ST	235,463		E	235,478
	76	235,396		207	235,412			235,431		97	235,447		15AJ	235,459	D64—	11A	235,480
	97	235,397	D8—	98	235,414		211	235,432		147	235,448		A	235,458	D68—	1	235,481
		235,398		191	235,415			235,433		148	235,450	D45—	10	235,466	D70—		235,482
	113	235,399		229	235,416	D13—	1B	235,437	D26—	5C	235,451	D48—	2	235,467	D83—	B	235,486
	114	235,400		259	235,417		H	235,435			235,452			235,468		E	235,485
	120	235,401	D9—	9	235,418			235,436			235,453			235,469		J	235,483
	209	235,413		193	235,419		R	235,434		6	235,454		20H	235,470		N	235,484
	252	235,403		247	235,420	D19—	26	235,438		14A	235,455		24A	235,471	D87—	R	235,487
D7—	43	235,404	D10—	39	235,421			235,439		K	235,449		31	235,472			235,488
	50	235,405		96	235,422		62	235,440	D27—	36	235,456						

CLASSIFICATION OF PLANTS

P. —	85	3,731	P. —		3,732	P. —	88	3,730			

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6 :	235,393		235,483	17 :	235,391	29 :	235,412		235,458		235,466
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PLANT PATENTS

17 : 3,731	27 : 3,732	40 : 3,730			

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